



AR

THE ARCHITECTURAL REVIEW VOLUME CXXXVIII NUMBER 823 SEPTEMBER 1965 FIVE SHILLINGS



# STEEL

## SPEEDING TRAFFIC FLOW



**Steel—for the road ahead** The speed of steel construction is just one of its vital contributions to Britain's expanding road programme. Rapid progress is essential if traffic flow is to be maintained satisfactorily in view of the fast-growing volume of traffic. Even now steel is showing how this can be done—with economy and efficiency—in swiftly-erected bridges, flyovers, elevated highways, off-street car parks, multi-level interchanges and other road structures. Advanced design in steel, new developments and new techniques in its use, are together providing efficient solutions to modern-day traffic problems that Britain's economic progress demands.



**Steel elevated road** Fylde Junction Higher Bridge at the 3-level Broughton M6—A6 traffic interchange. This attractively designed welded steel box girder viaduct, supported on steel piers, has a curved length of 1,300 ft. The Structural Deck (above) comprises a 14 ft. wide, 8 ft. deep, three-cell welded spine beam with 14 ft. long cantilevers on each side.

## SOLVING THE PARKING PROBLEM



**Quick solutions—in steel** Many multi-storey steel car parks are easily dismantled and re-erected, and can thus meet temporary demands for central area parking on vacant sites during urban renewal schemes. 'Wheelright' 3-arch ramp-type car park, Birmingham, holds 400 cars on a site due for future redevelopment. This system is quick to erect and available in many forms.

**Urgently needed:** More off-street parking, to give the motorist a clear road ahead. Choose your car park in steel—for the simplest, *speediest* solution to your parking problem. Park up, with the help of steel and vehicle capacity of an existing car park or new site can be quickly multiplied as many times over as planning demands. Standard steel units keep down costs in all types of multi-storey parking systems and fire-encasement of steelwork is often unnecessary. Open-deck one-level, split-level or sloping-ramp 'drive-in' parks employ high-strength lightweight steel frameworks with the cost-saving advantages of fast, dry, all-weather construction.



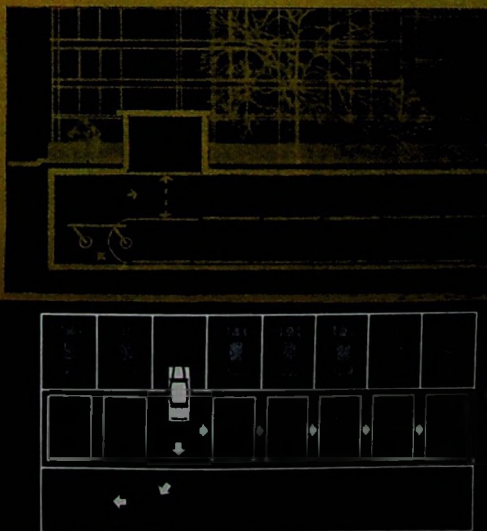


**Attractive colour** Special care in bridge design, and imaginative use of a wide variety of colour finishes — made possible with steel construction — combats monotony for travellers on the newly-completed M6 Lancashire motorway. Two of the many individually treated, coloured bridges: Top—Stacky Brow. Below—Southworth Hall.



**Stylish span** Attractively designed steel plate-girder motorway bridge. Good clean design is now achieved employing modern welding techniques, resulting in smoothly contoured, aesthetically pleasing steel bridges and other structures. New protective systems also permit choice of durable finishes in colours to suit each bridge site.

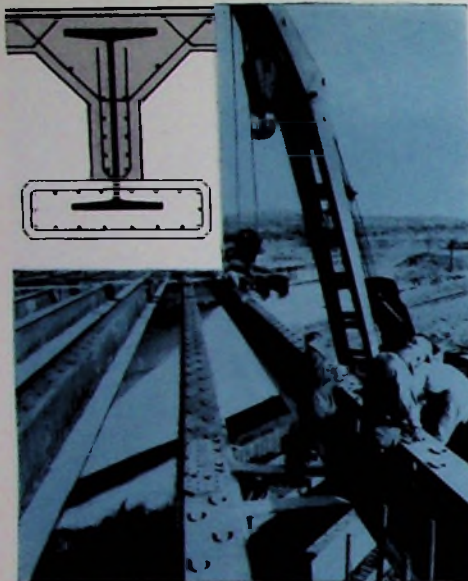
**Bridging the Isis** Graceful new 3-span bridge on Oxford Southern By-Pass Extension. Steel superstructure of 10 continuously-welded girders, Universal beam diaphragm cross-girders, RHS cross-bracing at piers. Steelwork is protected by blast-cleaning, zinc spraying, zinc chromate paints, before site application of durable colour finish to suit the bridge's river setting.



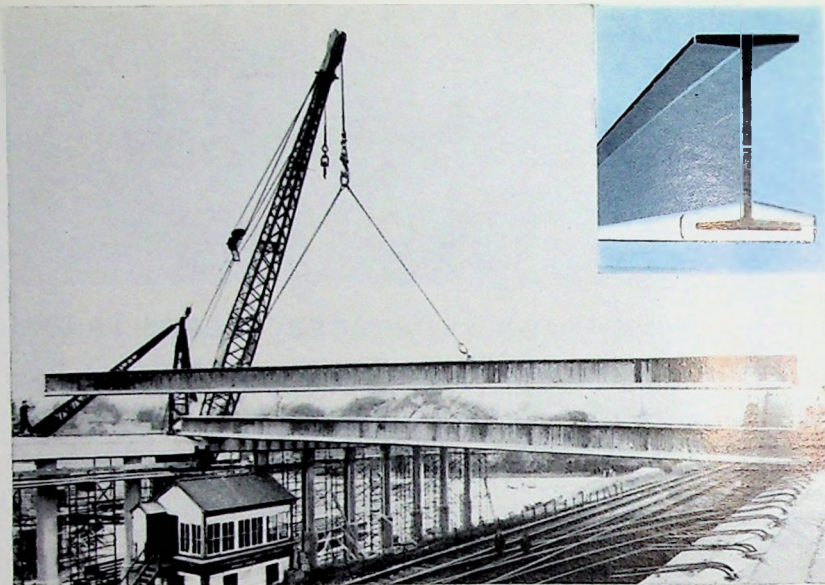
## STEEL EQUIPS THE MECHANICAL CAR PARK

Fully automatic 'Auto-Park' stores vehicles in two rows on a side entry conveyor belt holding up to 60 cars. Push-button release of any vehicle. The system capacity of basement garages or parks, and can be adapted to a minimum of expenditure.





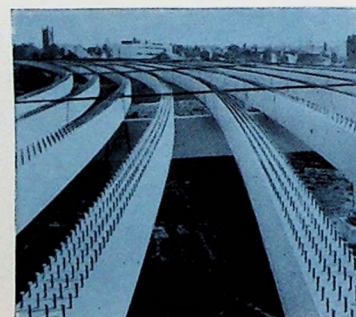
**'Preflex' beams** provide one of the most economic methods of combining long spans with shallow depths or higher loadings. (INSET) Stiffened steel T section with concrete-encased lower flange permits valuable economy and speed of construction in bridges, flyovers, multi-level junctions. (Scratchwood Bridge, M1 Extension.)



**Novel use of 'filler' joists** has cut costs, sped completion on many M1—M6 'Midland Links' motorway bridges. Site labour was reduced by about a third. Erection proceeds fast—no temporary shuttering or staging, little interference to traffic—using these (INSET) Universal high-yield steel beams with concrete-clad lower flanges.



**Steel chosen for Hill Cross flyover** A further elevated section of Coventry's Inner Ring Road is to take shape in steel. Steelwork is planned to proceed quickly on this 672 ft. long viaduct. As with the now completed Moat St. flyover, prefabricated welded box-section beams and stanchions will be transported to site with stud shear connectors welded on. Steel offered lowest cost, including maintenance.

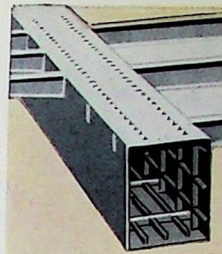
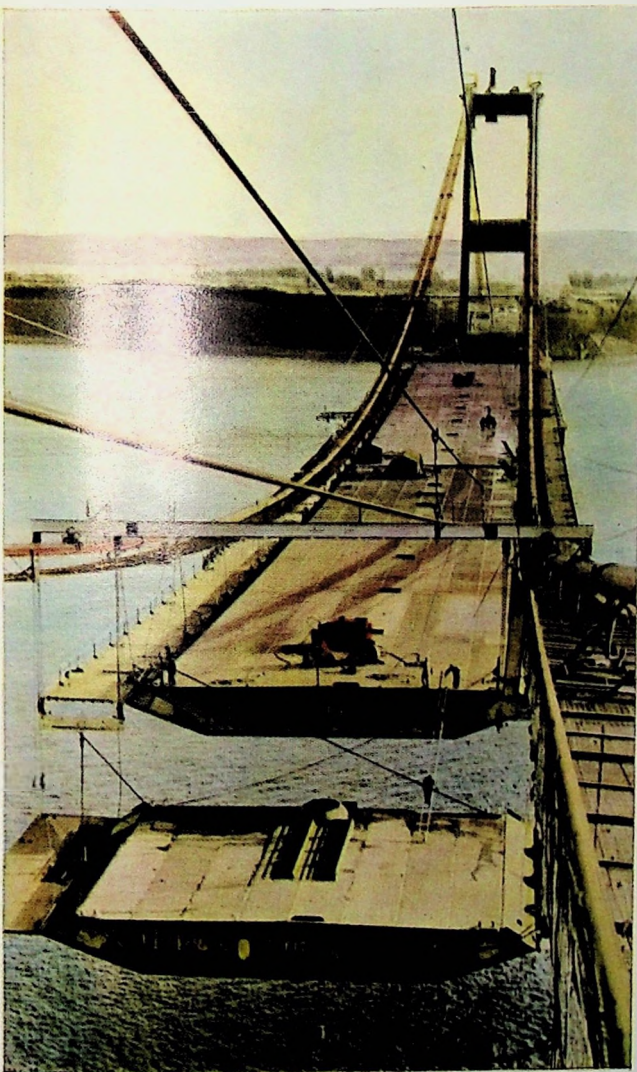


**'Multi-park' Steel-framed multi-storey system** reduces construction costs by maximum use of standardised structural steel components in its multiple, modular parking grid units. Factory-built sections allow quick erection of one-level, split-level, or sloping-ramp car parks of any height or capacity.



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**Severn Suspension Bridge** A vital, and elegant, steel link in the M4, London—S. Wales motorway. Streamlined deck structure comprises 60 ft long continuously-welded box sections with cantilevered footways. The structure largely employs high tensile BS 968 :1962 steel—in the slender 400 ft box section towers, shallow 10-ft-deep decking, and (INSET) welded box girders used for the Aust viaduct approach. Steelwork design refinements have cut costs, and reduced weight in the bridge structure by 20 per cent. Main suspension cables employed 18,000 miles of high tensile galvanised steel bridgework.



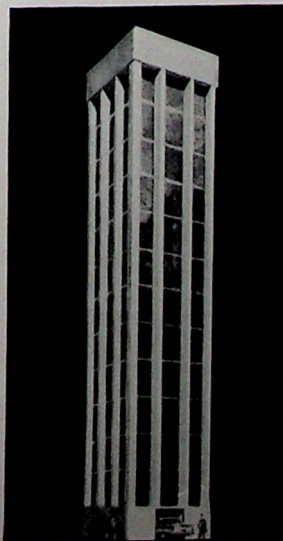
**9½-hour flyover!** Rapidly erected short-span motorway bridges and flyovers: Universal beams cut erection times and costs, minimise traffic dislocation. Steelwork for Newhouse flyover (A8, Glasgow-Edinburgh) was erected in only 9½ hours. Larger AUTO-FAB beams in a range from 42 inches and up to 78 inches deep now allow very high safe loads with similar economies.



**Sweeping elegance in steel** Proposed design of new 1,000-ft-long Erskine bridge across the Clyde, has a welded steel superstructure of shallow depth and clean, aesthetically pleasing lines. Main spans consist of a single box girder with inclined webs. Cantilever brackets support outer footways and cycle tracks. Cables positioned between the carriageways support the deck and pass over twin 128-ft-high welded steel masts above main piers.



**Vertical 'Keypark'** Fully automatic steel-pallet/high-speed lift system meets high-density parking needs. Rust-proofed, pre-fabricated steel frame structure employs standard modular units. This system's ability to increase the car parking capacity of a small site, measuring only 24 ft x 22 ft, by up to 1,000 per cent, makes 'Keypark' especially practical where land values are high. Can also be installed integrally within buildings.



**Mechanical parking systems in steel** employing lifts or conveyors give high density horizontal or vertical vehicle storage. These can make maximum use of expensive or very limited land space, can be fitted into existing buildings or erected quickly on confined sites adjoining offices, flats, factories, and hospitals.

**'Liftpark' mechanical system** Standard unit paternoster system parks 20 or more vehicles on ground space normally required by two cars. Bolted steel structure is easily dismantled and re-sited. May be installed above or below ground with 'drive-in' at any level, or incorporated vertically or horizontally within buildings. System is available fully automated with personal key control or coin-collection.







1



2

## STEEL SAFEGUARDS, SEPARATES, SPEEDS TRAFFIC

**1 Safe Walk-over** Lightweight tubular steel footbridges of this type are erected in 1 day—at 1/5 cost of subways. Suitable for busy High Streets, school crossings; available with pram ramps. **2 Stronger side protection** on elevated carriageways, bridges, other road structures. Barrier in hollow steel sections deflects vehicles safely along its length on impact. **3 Pedestrians/Steel/Vehicles** Steel railings fabricated in Structural Hollow Sections aid better road use, separating pedestrians from vehicles, giving drivers extra confidence so that traffic speeds are increased at busy centres. **4 For new road signs** steel offers superior strength, stiffness and resistance to damage, ease of fabrication and erection, ready availability, low cost. Steel sheet is available in more finishes than any other traffic sign backing material:— new, durable paint systems, stove enamel, vitreous enamel, plastic and reflective coatings. **5 Steel fender design**, to reduce impact damage—for bridges, embankments, car park ramps, traffic hazards, central and side barriers on motorways.



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4



5

## REFERENCES:

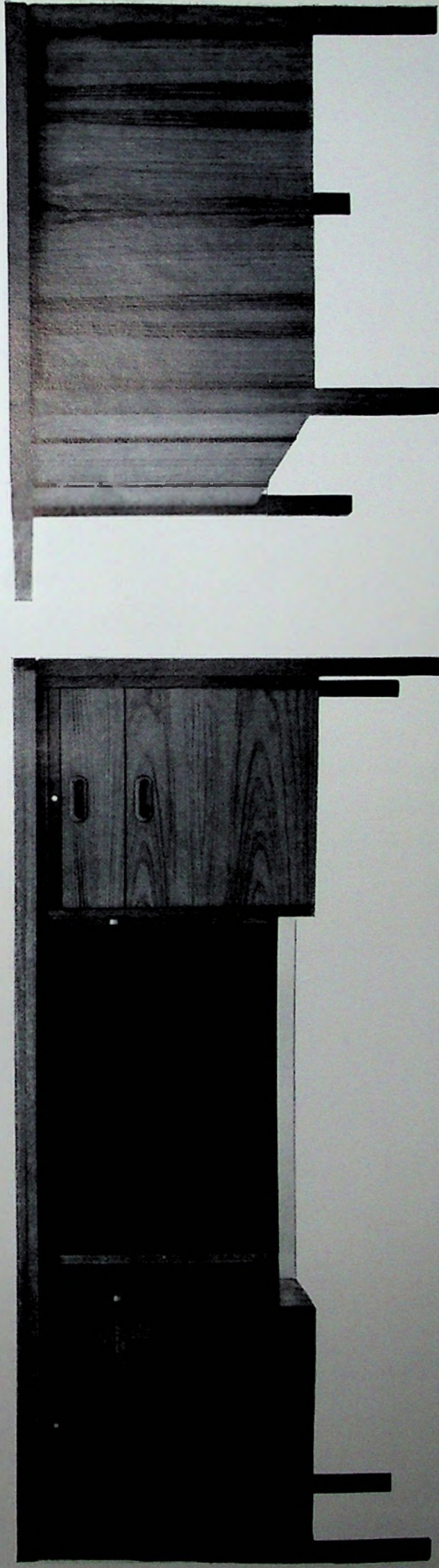
**ROAD TRAFFIC BRIDGES** FYLDE JUNCTION HIGHER BRIDGE AND M6 BRIDGES—Lancs. County Council as agents for the MOT. County Surveyor and Bridgmaster: Mr. James Drake, CBE, BSc, MICE, MI Mun E, PP Inst HE. 'PREFLEX' BEAMS—HENDON MOTORWAY BRIDGES General Contractors Holland & Hennen & Cubitts Ltd.—Boulton and Paul (Steel Construction) Ltd, Norwich. HILLCROSS FLYOVER—Coventry, City Engineer and Surveyor, Granville Berry, M Inst CE, M Inst Mun E, FIES. MIDLAND LINKS BRIDGES M1-M6, Consulting Engineers, Sir Owen Williams & Partners, London. SEVERN BRIDGE Joint Consulting Engineers for the MOT, Freeman, Fox and Partners, and Mott, Hay and Anderson. AUST VIADUCT Fairfield Shipbuilding and Engineering Company Ltd, Chepstow. THE A8 NEWHOUSE FLYOVER Scottish Development Department: Lanarkshire County Council, County Surveyor, Col. T. U. Wilson, MICE, MI Mun E. ERSKINE BRIDGE Erskine Bridge Joint Committee; Freeman, Fox and Partners. ISIS BRIDGE—Oxford Southern By-pass Extension, Oxfordshire County Council, County Surveyor, K. A. Summerfield, MSc, MICE.

**CAR PARKING SYSTEMS.** 'MULTI-PARK', 'KEYPARK', 'AU-RO' and 'DOUBLE-RO' Chamberlain Parking Systems Ltd, London SW1. 'TEMPARK' Braithwaite & Company Structural Ltd, R. M. Douglas Construction Ltd, Council of City and County of Nottingham; Engineer, F. M. Little, BSc Tech, MICE, MI Mun E. AMI Struct E. LIFT PARK The Butterley Company Ltd, London SW1. PEDESTRIAN FOOTBRIDGE Tubewrights Ltd, Liverpool.

# DESIGN IN STEEL

**BRITISH IRON AND STEEL FEDERATION** STEEL HOUSE TOTHILL STREET LONDON SW1





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## Internal Partitioning (Left)

'Venesta' composite board used for partitioning at BEA Air Terminal, Kensington. This board is a sandwich structure comprising plasterboard and asbestos faced with PVC. The centre filling is Shell 'Styrocell'. Contractors: Tenon Contracts Ltd.

## Infill Panels (Top right)

1 1/4" 'Styrocell' faced both sides with 1/8" asbestos wallboard, the external face of panel being treated with Arpax, for multi-storey flats at Leyton. Contractors: Wates (London) Ltd.

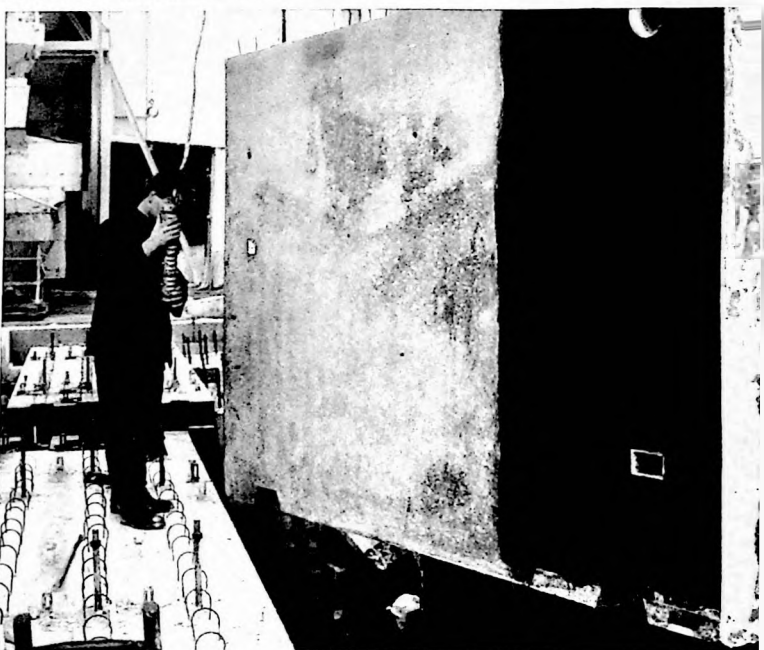
## Wall-line Panels cast in situ (Centre right)

Consisting of 7/8" 'Styrocell' faced on exterior with 1/8" Eternit Emaile, the panel is cast on to the face in one operation on the site. An example can be seen in position at the end of the balcony (top right).

## Wall-line Boards for Dry Lining (Bottom right)

For flats at Southampton: constructed from plasterboard on 'Styrocell', these are quick and easy to fix. Contractors: Reema Ltd.

Boards and panels shown are in all cases made by Venesta Manufacturing Ltd., Erith, Kent. For more information on versatile 'Styrocell' in building applications, write to Plastics Advisory Service, Shell Chemical Company Limited, Plastics & Rubbers Division, Shell Centre, Downstream Building, London, SE1.



**SHELL PLASTICS IN THE FIRST PLACE**

Shell Chemicals







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**The building: Cottenham Village College Cambridge**

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*Contractors:* Grant & Dodson Ltd., 23 Saint Andrew's St., Cambridge.

*Bricks supplied through:* Cyril Ridgeon & Son Ltd.



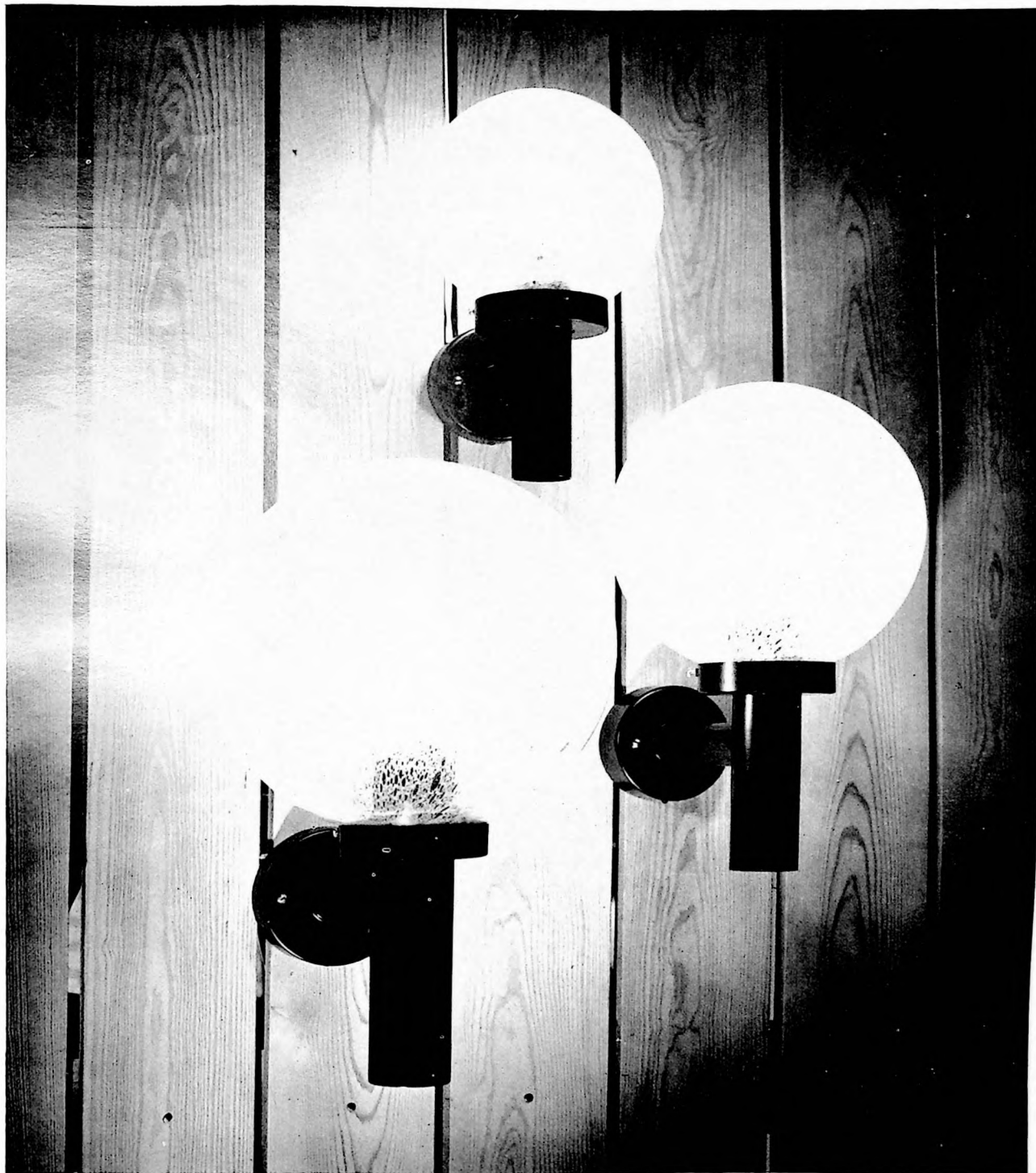
See the permanent exhibition of the Ibstock group's machine and handmade bricks at the Ibstock showrooms,  
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**IBSTOCK** who produce Ibstock, Himley and Aldridge facing bricks

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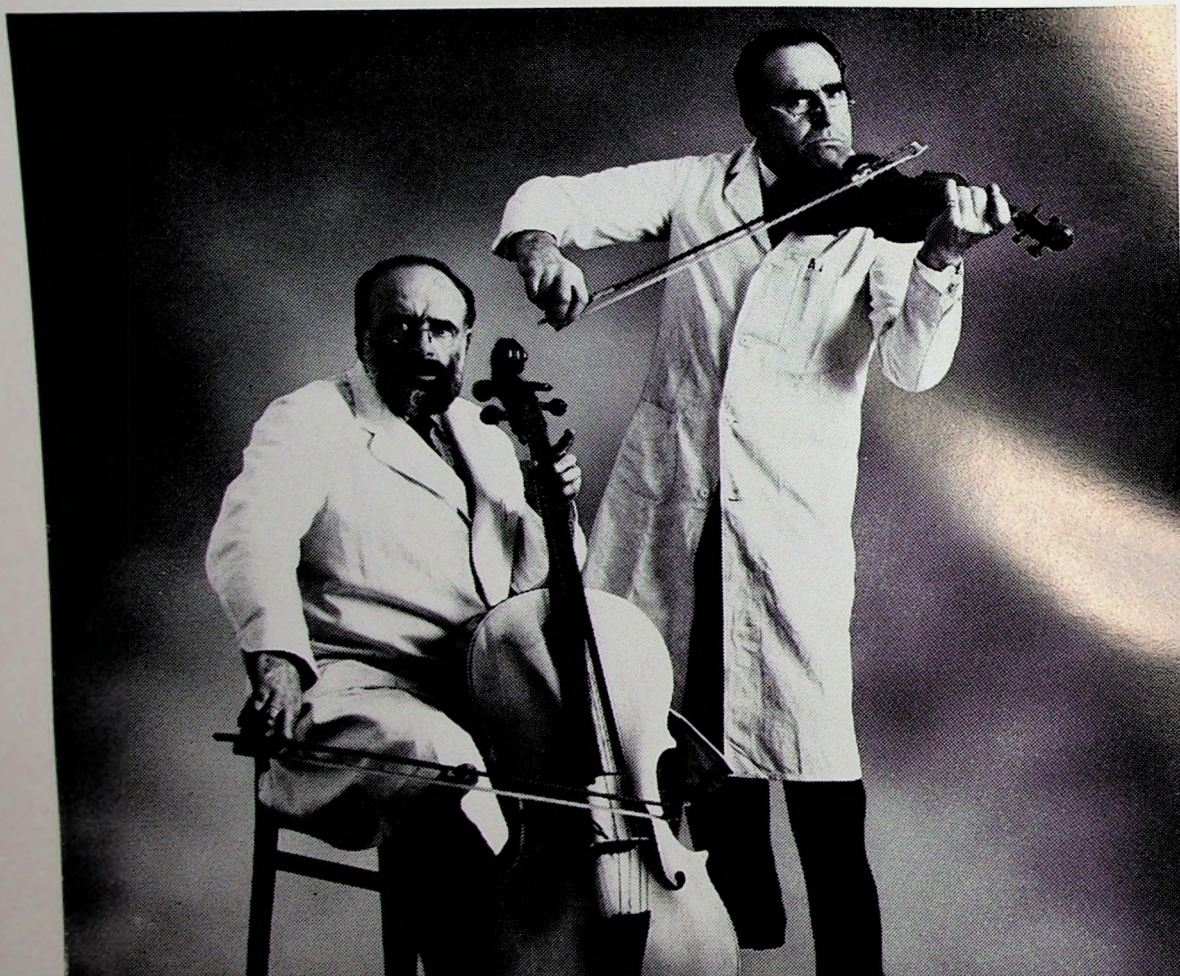
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model no.	diameter of glass	projection from wall, overall
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V187/300	12"	15½"

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**EVOMASTICS**





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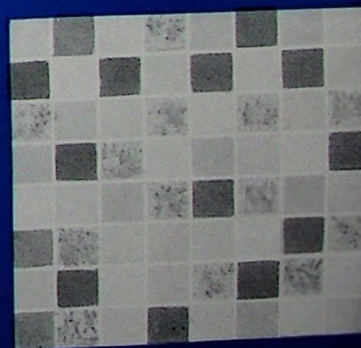
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AR965



# check these marks for Beta 5 lanterns

Q

*Does this fitting conform with all regulations for Group B lighting?*

Yes. Specially designed for 15 ft. mounting height, spacing 90-120 ft. it conforms to BSS 1788.

10/10

A

Q

*Are (a) initial, (b) maintenance costs low?*

(a) Yes. (b) Yes. Note quickly detachable bowl design for immersion cleaning — excellent for all, but especially so for those using bulk immersion cleaning of bowls at Depots.

10/10

A

Q

*Will Beta 5 lanterns suit latest slim columns?*

Yes. The lamp's control gear is housed within the lantern canopy. Adequate space left for time switches and fuses in the chamber at base of column.

10/10

A

Q

*Will the lantern take our own preferred light source?*

Yes. The lantern will accommodate 45/60SOI/H, SO/H and 40 watt SOX lamps, all of which operate with the control gear as supplied.

10/10

A

Q

*How many marks do I get for saying I want information on price, delivery and a dozen other matters including "side or top entry mountings"? What about corrosion resistance, what about the optical data, dimensions?*

You get full marks for these questions (and the answers) if you direct them to

10/10

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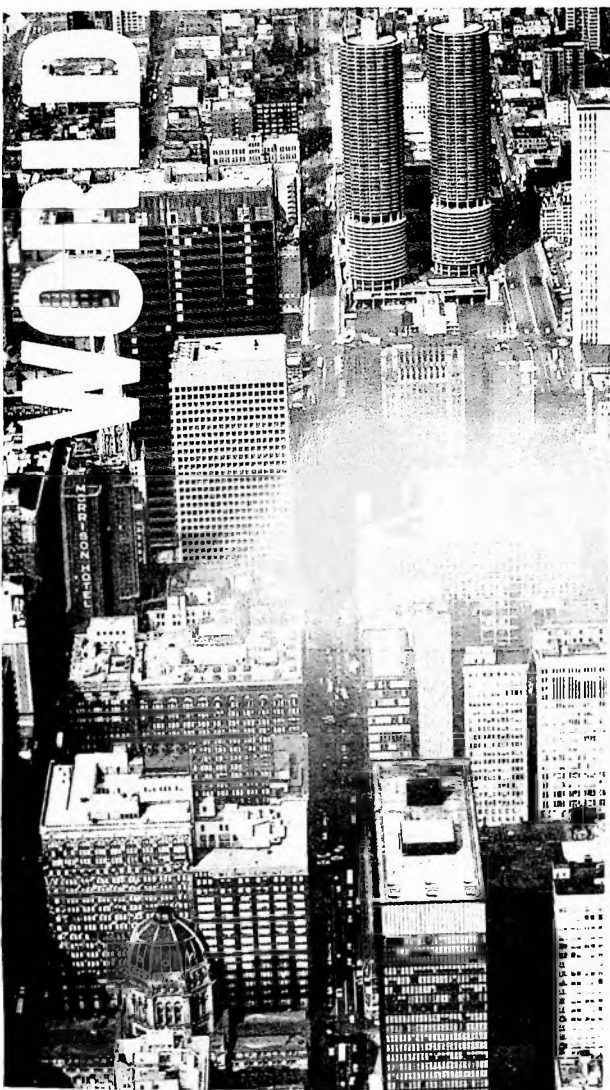


# HOSPITAL BOARD OFFICES CHESTERTON, CAMBRIDGE

*Main Contractors*

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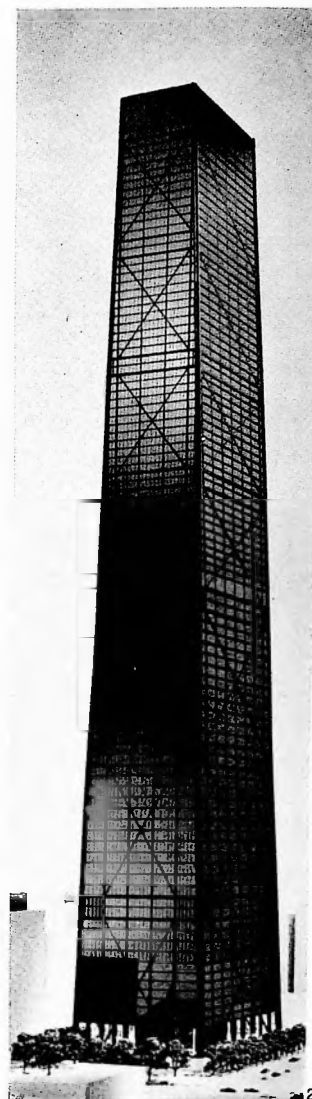




# CHICAGO EXPLOSION

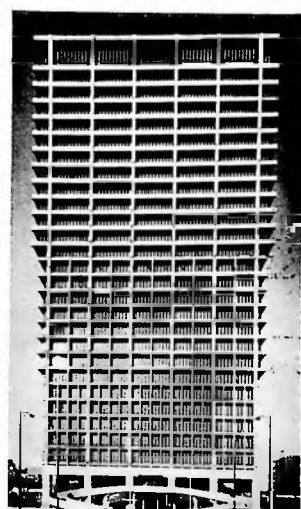
Now that top architects are symbols of prestige, it is not Manhattan but Chicago, where a living tradition of skyscraper building has survived since the days of Jenney, Sullivan and Root, that is gaining in its cityscape because of the consistent rationalism of its architects. In the procession of towers that now lines Dearborn Street, 1, only Bertrand Goldberg's Marina City, with its twin foliated cylinders, has the exclamatory brashness of the West. Immediately below it, to the south, stands the new Civic Centre, 31 storeys of rusted steel, 3, designed by C. F. Murphy Associates with Skidmore, Owings & Merrill and Loeb, Schlossman & Barnett. Next to it, on the north, is the 37-storey Brunswick Building, designed by SOM alone, with its load-bearing columns gathered into a single cylinder at first-floor level. Next to that will soon rise the 60-storey, 800 ft. First National Bank of Chicago building, 4, designed by Murphy with the Perkins & Will Partnership. Its curvaceous silhouette reflects the vast scale of the Savings Bank operations in the lower floors. Only for a few months will it be the tallest American building outside Manhattan; for SOM have recently revealed their 98-storey, 1,100 ft. John Hancock Centre on Chicago's North Side, 2, cross-braced and tapered like the Eiffel Tower. The cross-braced structure was foreshadowed in another recent SOM project for Alcoa, 6, which will enliven San Francisco's disappointing Golden Gateway Centre. Greatest of all SOM's present Chicago works is their 34-acre campus for Illinois University (Walter Netsch in charge), of which the administrative block, 5, with its doubled-up structural load in the lower floors, is only a first part.

Back to Dearborn Street: at the centre base of 1 is the roof of the Monadnock building. Diagonally across the road from it is the first



## acknowledgments

COVER: Christopher Morris. **WORLD**, pages 157-160: 1-3, 5, 9-12, 15-17, *Architectural Forum*; 4, 22-24, 33, *Progressive Architecture*; 7, 8, 13, *Architectural Record*; 14, *Architectural Association Journal*; 18, *Engineering News Record*; 20, 21, *Potomac Valley Architect*; 25, 26, Camera Center, Charlottesville; 27-32, *Arkitektur*; 34-41, *Domus*; **VIEWS AND REVIEWS**, pages 161-163: 3, 4, *Reinisches Bildarchiv*, Stadtmuseum Cologne. **FRONTISPIECE**, page 164: Penelope Reed. **RESIDENTIAL BUILDING**, *PETERHOUSE*, CAMBRIDGE, pages 168-171: Brecht-Einzig. **THE MORPHOLOGY OF FLOWING TRACERY**, pages 172-180: 1, 2, 4, 5, 7, 11, David Etherington; 3, A. F. Kersting; 6, National Buildings Record; 8, Walter Scott. **AVIARY**, LONDON **ZOOLOGICAL GARDENS**, pages 181-188: 1, 9-11, Christopher Morris; 2-8, Sam Lambert. **REPORT FROM ROUMANIA**, pages 189-196: 2, 16, 17, 24-27, 31, 32, Richards Arphot. **INTERIOR DESIGN**, pages 197-200: John McCann. **GALLERY**, pages 201-203: 1, 2, Leicester Galleries; 5, 6, Robert Fraser Gallery, Geoffrey Clements; 7, Sydney W. Newbery; 8, Marlborough Fine Art. **BRENTFORD RIVERSIDE**, pages 204-207: 1-4, Browne Arphot. **HOSPITAL BOARD OFFICES**, CHESTERTON, CAMBRIDGE, pages 208-210: Galwey Arphot. **DESIGN REVIEW**, pages 213-214, Galwey Arphot. **MISCELLANY**, pages 215-226: Olana Falling, Wayne Andrews; **Non-conformist Furniture**, 1-3, G. Catley; **Surprise in Islam**, 1-8, 10, Elisabeth Beazley; 9, John Donat; **Newhaven Kilns**, Edwin Johnston. **THE INDUSTRY**, page 232: 1-4, Dennis Hooker. **STOP PRESS**, pages 233-234: 2, 3, 5, 8, Nairn Arphot.



This month's cover shows a detail, photographed by Christopher Morris, of the interior of the new aviary at the London Zoological Gardens, which is described and illustrated on pages 181-188 of this issue.



# THE ARCHITECTURAL REVIEW

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Directing Editors	J. M. Richards Nikolaus Pevsner H. de C. Hastings Hugh Casson
Executive Editor	J. M. Richards
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Townscape Editors	Kenneth Browne Ian Nairn
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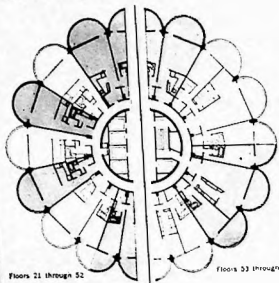
## CONTENTS

- 157 World
- 161 Views and Reviews
- 164 Frontispiece
- 165 The Developers:  
*Lionel Brett*
- 168 Residential Building,  
Peterhouse, Cambridge:  
*Architects, Sir Leslie Martin and  
Colin St. John Wilson*
- 172 The Morphology of Flowing  
Tracery:  
*David Etherton*
- 181 Aviary, London  
Zoological Gardens:  
*Designer, Lord Snowdon, in  
association with Cedric Price and  
Frank Newby*
- 189 Report from Roumania:  
*J. M. Richards*
- 197 Interior Design: Cinema,  
Oxford Street, London:  
*Architects, David Dry, K. Halasz  
and Associates*
- 201 Gallery
- 204 Townscape  
Brentford Riverside:  
*Kenneth Browne*
- 208 Hospital Board Offices,  
Chesterton, Cambridge:  
*Architects, Johns, Slater and  
Haward*
- 211 Contemporary  
Draughtsmen: 10  
*Victor Lazzaro*
- 213 Design Review  
Miscellany
- 215 Olana Falling
- 218 Non-conformist Furniture
- 219 Surprise in Islam
- 224 Newhaven Kilns
- 228 Skill  
Static Communications 1:  
*Keith Harrison*
- 232 The Industry  
Contractors, etc.
- 233 Stop Press



# CHICAGO

completed slab of Mies's Federal Centre, 7, designed with Murphy and other firms (another sign of better federal standards—see last month's World). A 43-storey tower and Post Office pavilion will follow on the other side of the street, grouped à la Lake Shore Drive round a broad plaza 8. (The building next to the slab in 1 is SOM's elegant Inland Steel.) Mies's

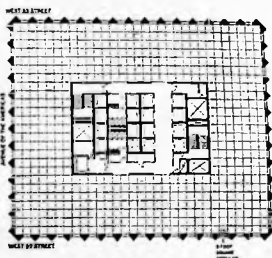


Floors 21 through 32 Floors 33 through 44

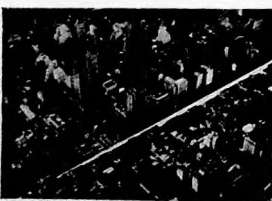
puritanism is perhaps becoming excessively repetitive: 9 shows his Westmount Centre project for Montreal, which follows the trend to comprehensive redevelopment in that city shown first in Poi's Place Ville-Marie and in the Nervi-Moretti Place Victoria, of which the first tower is now complete.

Marina City itself was given an interesting critique in *Forum* by John Morris Dixon, who contrasted its somewhat pinched inner spaces, 10, lacking much of the intended flow through to the balconies, with its masterfully detailed 'outer space' image. In spite of the cluster of facilities in the podium, 11, which provides the commercial backing for the surprisingly cheap flats above, and the marina itself, 12, which makes brilliant use of the space left over from structural columns and waste chutes, Goldberg's plaza fails to cohere as a public space—largely because of the contrasting form of the office block (rear in 12).

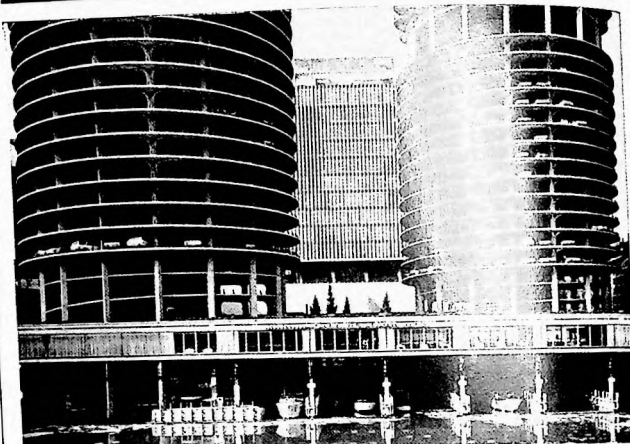
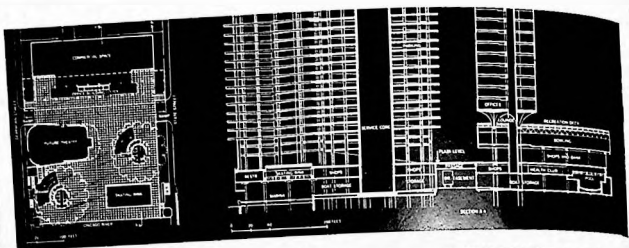
The same understandable reaction against Mies's chilliness, with the same failure to produce better civic spaces, is shown in Saarinen's majestic CBS tower in New York, 13. Its triangular columns are set so thickly as to become in effect a loadbearing wall, which supports 35 ft. clear office space



14



15



16

round the core, 14. Unfortunately another firm has been given the interiors to fit out. The noble granite veneer externally, although a justifiable rebuke to its tinny neighbours, surprisingly fails to achieve Saarinen's expressed aim of 'soaring,' and as at the London Embassy, the setback of the sunken plaza from the streetline leads to a leakage of space all round. *Forum* justifiably compared the chaos of Sixth Avenue's eight new towers, 15, with the adjoining Rockefeller Centre, 16, which thirty years ago achieved common service routes and public spaces. The New York grid demands integration; by contrast, at the mouth of the Chicago River, 17, away from the dense urbanity of Dearborn Street, individualistic steeples cluster happily as, in *Forum*'s words, an expression of 'sheer audacity in building.'



17

## RESTON'S CLUSTERS

America's first 'new town' in the British sense, though late in the day, promises to be more sophisticated in some respects than our own high-minded programme which so often disappoints in its actual results. Reston, not far from Saarinen's Dulles Airport, is the brainchild of Robert E. Simon, Jr., of Simon Enterprises Inc.—and probably its private enterprise origin as well as its low average density of eleven people per acre have tended to induce scepticism. Yet density as always is misleading: only 15 per cent of the houses are detached and the co-ordinating planner, William J. Conklin of Whittlesey and Conklin, has concentrated the 70,000 population into clusters of dwellings, which conceal car parks and conserve the landscape. The main problem remains: will Reston attract its own industry? Estimates of future commuting vary

from 40 to as much as 70 per cent.

The first of the seven 'village centres,' with its lakeside point block, 18, has had its central buildings designed by Conklin, with a housing cluster (right in 18) by Charles M. Goodman and smaller terraces (background) by Chloethiel Woodward Smith. (These three architects, together with Geddes, Brecher, Qualls and Cunningham of Philadelphia, will



18



## RESTON NEW TOWN



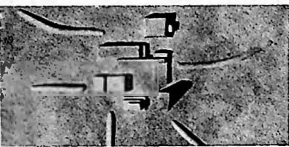
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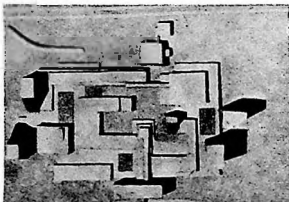
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21



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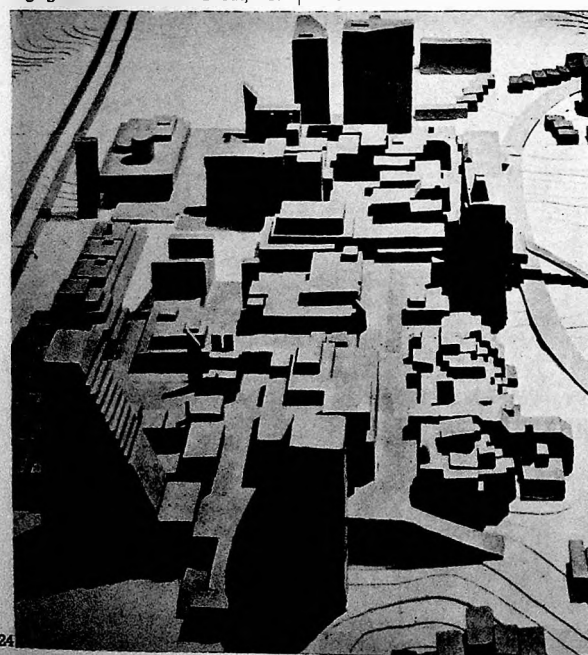


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form an 'architectural review board' to control the privately built detached houses.)

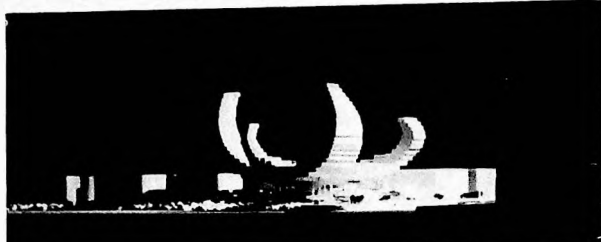
Progress on the first village is fast. 19. Goodman's cluster, 20, covers its car parking with a central plaza; the houses look out from garden courts, 21, to the wooded glens. The main lure for residents so far is the central golf course (clubhouse by Goodman); popular as the town already is, it may still end, like Hampstead Garden Suburb, as a middle-class utopia.

*Progressive Architecture's* June issue admirably presented the story of Conklin's eight successive designs for the main town centre, from a conventional grid to an extreme Cumbernauld type. The final version, 24, is an interesting compromise: a conventionally arranged precinct, 22, which expands vertically down the hillside so that, when it is commercially viable, full-scale vertical segregation can be carried out, 23.



24

Visually, the hillside will pleasantly exaggerate the urbanity of the terraces and towers.



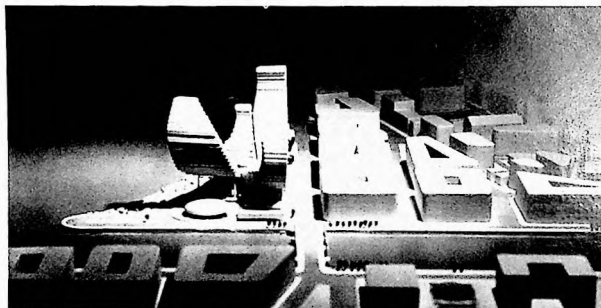
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## DISTINCT CONTAINERS

The first international competition for some time to produce a genuinely exciting idea (instead of boxes fitted together by teams of Polish architects) was that for the Kursaal site at San Sebastian, the Spanish resort which flourishes as the summer seat of General Franco. On a base of shops, auditorium, swimming pool and skating rink will rise a 300-bed luxury hotel and 105 apartments. The winners, Jan Lubicz-Nycz (Britain), Carlo Pelliccia (Italy) and the structural consultant, Dr. William Zuk (USA), who are all on the staff of the University of Virginia, propose to put these residences into two dramatically stepped, vertical crescents raised on stilts, 25. They think that architecture 'will become a discipline concerned not with single and competing buildings but will seek conceptual and formal solutions in terms of multi-occupancy structures,' which they call 'con-

tainers.' The scheme is 'a distinct structure related to the city of San Sebastian and the geographical location.'

Instead of a kit of parts, then, the architects have imposed a formalism so strong that it cannot be thrust apart, whatever gutting and remodelling may happen inside (c.f. Sir Leslie Martin's ziggurats for Whitehall). Evidently the section and the arrangement of the services impressed a jury including Ernesto Rogers, Pierre Vago and Heikki Siren. But can the whole structure be expanded and still be 'related to the geographical location' of the Urumea estuary, 26. What would San Sebastian look like with six gull-wings instead of two? The aim of these dramatic forms must surely be not to form a generalized structure, but, as the civic focus of San Sebastian, to form a unique monument à la Sydney Opera House.



26

## ERSKINE'S TIBRO

For Ralph Erskine, the Team-X village aesthetic, applied on its largest scale at our own Cumbernauld, has arisen directly out of the problems of community life in a northern climate. The Brittard area, recently finished at his new town of Tibro, 27, is typical: although it is built on a limited budget with severely standardized concrete crosswall plans and prefabricated parts, Erskine has mixed flats and maisonettes with family houses and old people's dwellings. He has also mixed colours with discrimination: lightweight concrete cladding in light grey for the flats and in white for the houses, red and green woodwork, black trim to the concrete-framed balconies and to chimneys, front doors in many different colours.

The main square, 28, has variety and humanity in spite of long access

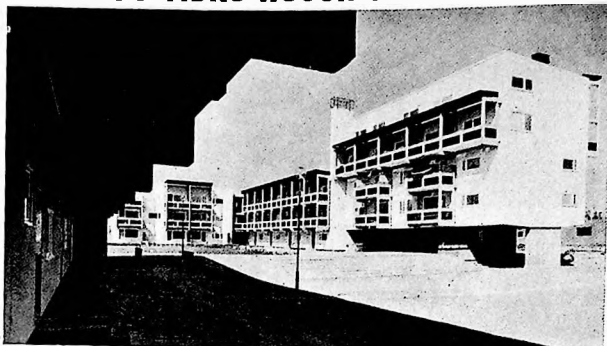


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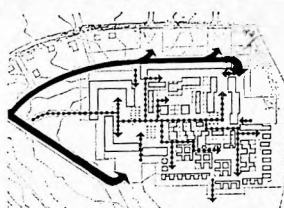


## ERSKINE'S TIBRO HOUSING

28



galleries; there is none of the tendency to kill with kindness apparent in Cumbernauld's meticulous landscaping. Pedestrians and traffic are carefully segregated, 29; garages are grouped, so circulation is not overcontrived. The family houses form charming groups, 30; in the background can be seen some of the maisonettes which vary the upper floors of the main blocks.



29

30



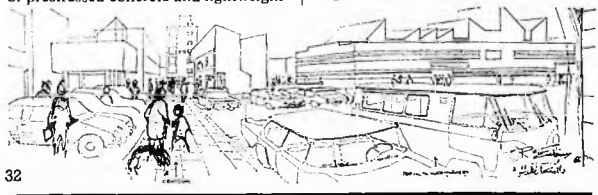
In the Spratleto area of Tibro, there will be 180 owner-occupied houses, 31. Here Erskine has only co-ordinating power, laying down a standard roof pitch, with standard facing materials and fences. This fairly liberal approach will form an interesting comparison with Cumbernauld's wholly prefabricated owner-occupied houses at Park 4 (AR January, 1965).

The municipal building, 32, for which the associate is also an English architect, Mike Linnett, will be built of prestressed concrete and lightweight

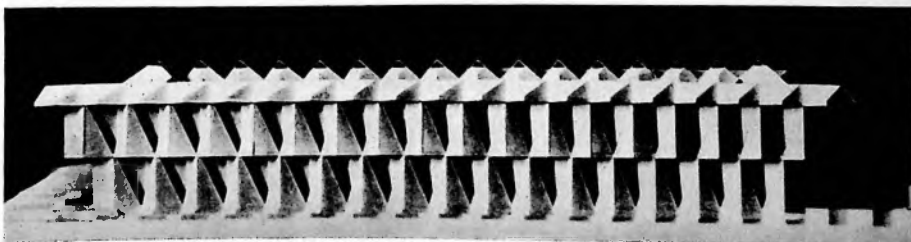


concrete units. The main pedestrian route through the centre runs alongside.

32



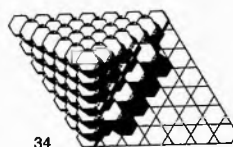
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160

## A YIDDISH GRID

The first finished block of the town hall at Bat Yam, 33, an industrial town close to Tel Aviv, looks at first sight like a film set for 'I was a Teenage Tange.' Its violently triangulated geometry, its tortuous rooflights and its internal diagrid assert a personal flavour as intriguing as it may be

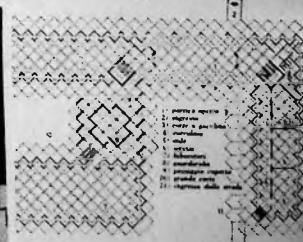
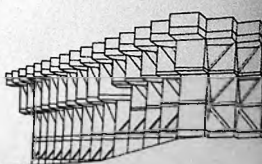
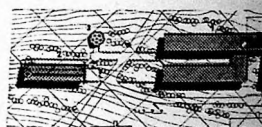
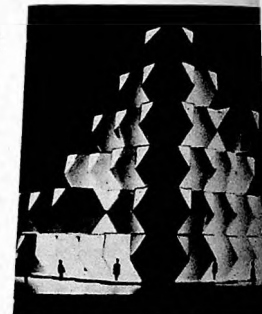


34

distasteful. Two of the architects, Zvi Heker and Eldar Sharon, are young, but the leader of the team, Alfred Neumann, is aged 65 and a former pupil of Behrens, Perret and Loos. Nor is this building an isolated freak, as the June issue of *Domus* revealed. For El Al they have designed a pyramidal air terminal on a triangular site in Tel Aviv, 34. Its single concourse, with a small gallery of offices projecting over the entrance, will be lit through each one of the prefabricated tetrahedrons, 35.

More important, Neumann and Heker only have designed a complex of three buildings, 36, for the engineering faculty at Haifa's famous Institute of Technology, and these are actually under construction, 37. The principal block of laboratories and lecture halls, 38, is built up with a series of triangular units, 39, with shuttered slit windows in the joints. The major part of the plan, 40, seems to satisfy at first sight, apart from some zig-zag corridors in the central link. The second main block, 41, containing electrical engineering workshops, has its units still further articulated.

The architects claim that their system is a completely integrated solution of the problems of heat, glare and rain. It will be interesting to see what use is made of the triangular bays along the perimeter.





## marginalia

### OPTIMISM AT CAMBRIDGE

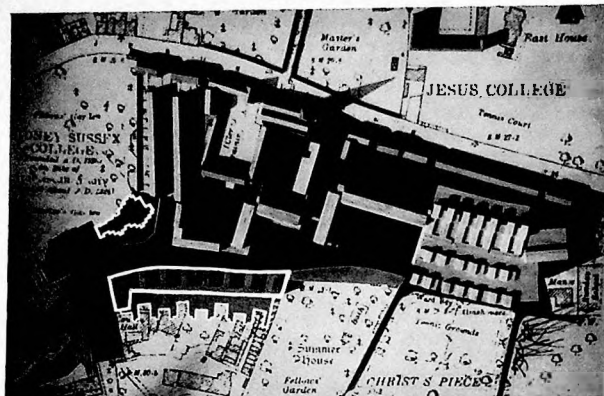
After fifteen years of sterile bickering since the 1950 Holford and Wright report on Cambridge, the city at last appears to be getting the kind of re-ordering it deserves. At the end of June reports were published on two of the five areas of redevelopment in the city centre. The Lion Yard scheme by the city architect, Gordon Logie, 'enthusiastically welcomed' by a unanimous city council, is a refreshing change from the speculators' carve-up rejected by the Minister in 1960. Mr. Logie proposes a unified structure of shops and public buildings on a two-storey podium (one storey below ground) of parking and servicing. The public buildings include a concert hall, small hall, art gallery and arts centre, YMCA, international centre and university music school. Residential buildings, rather meagre in scale, include a terrace of flats along Petty Cury and a hotel in place of Skipper's pleasantly Edwardian Norwich Union building in St. Andrew's Street.

The character of the pedestrian alleyways and yards is intended to

renew and extend Cambridge's intimate balance of white brick vernacular with glimpses of the monumental. At present only the outline is clear, with narrow shopping arcades opening through chamfered corners to the broader courtyards and foyers of the public buildings. The arts and commerce are judiciously mixed. The problems remain, whether the city council or developers or a public-private consortium will undertake the development and whether the city architect or several private firms will do the detailed design work. Mr. Logie's carefully organized scheme, with its sensitive bridge links to Philip Dowson's New Museums science buildings on the south, is a complete justification of his appointment in 1962 as the first non-county-borough chief architect; but an excessive conflict of outside architects' egos could upset the balance.

Commercially, the 30,000 sq. ft. of extra shopping space allowed by the Minister in the Lion Yard may still be enough to prejudice the new shopping centre being planned by Lord Llewelyn-Davies in the City Road area, closer to the main traffic routes and centres of population. It might still be better to have fewer shops and more flats in Lion Yard.

Between Lion Yard and City Road, next to the public park of Christ's Pieces, lies King Street, a ramshackle but picturesque thoroughfare of shops, almshouses and many pubs which still preserves the atmosphere of an East Anglian country town. Jesus College, which owns the area between King Street and Jesus Lane to the west, has published a promising outline scheme by Ivor Smith, of Morton Lupton and Smith. It includes the diversion of the street towards Jesus Lane to leave room for a multi-storey car park surmounted by flats overlooking the park. The rest of the development consists



2, aerial view of model of proposed King Street development, Cambridge. Shown in white outline are the buildings for Christ's by Denys Lasdun and for Sidney Sussex by Howell, Killick, Partridge and Amis.

of five-storey terraces, linked by pedestrian decks and forming a series of open courtyards. These spaces could perhaps with advantage be made less broad and windswept, and the buildings less tall (they are in fact twice as high as the adjoining Regency white brick terraces in Malcolm Street, which the Smith plan carefully preserves). The main cause for concern, however, is the Jesus scheme's lack of relation to Denys Lasdun's gently curving terrace for Christ's on the other side of King Street or to Howell, Killick, Partridge and Amis's serrated ziggurat for Sidney Sussex on the corner of King Street and Malcolm Street (neither of these have yet been published). The city architect is now moving on from the particular problems of Lion Yard to prepare a comprehensive transportation plan for the whole central area. In doing so, he may have some pertinent remarks to make on the consequences of college rivalries.

tion' areas (for instance near the cathedrals and in the historic core) where they will be banned and intermediate areas where each case will be carefully studied; studied, that is, to see how it will affect the image of the city, views of local landmarks and important buildings and areas of topographic and landscape value. Stress is laid on the advantages of early consultation before formal planning application is made and it is explained that in future, whenever a new project for redeveloping a large area of the city is envisaged, the city planning officer intends to prepare a master plan indicating where he considers the high buildings should go. K.B.

### VICTORIANS ADVANCE

Striking progress in the field of Victorian studies is shown in the annual report of the Victorian Society (28. 6d. from 55 Great Ormond Street, WC1). Membership has risen over 30 per cent in the last nine months, with the formation of new regional groups in Liverpool and Manchester; the academic side of the Society's work has found full expression in the annual conference (report of last year's and details of this year's, at Dorchester on 'Victorian Rural England,' can be had from Paul Thompson at the University of Essex, Colchester); and building preservation work has greatly expanded. Recent successes include the 'listing' of the Ritz Hotel, after questions in Parliament, and public inquiry victories for the National Provincial Bank, Bishopsgate, 13-15 Moorgate and Sudbury Corn Exchange. There have also been some regrettable losses, partly because of delays in listing by the Ministry of Housing and Local Government (this has fortunately been speeded up by the new Minister).

Most important in the Society's work has been its ability in recent months, under the chairmanship of Nikolaus Pevsner, to begin plugging some of the major planning loopholes affecting nineteenth-century buildings. A list of sixty railway stations of importance has been submitted to the Ministries of Transport and Housing; this is only a 'short list,' but a representative selection was made, including a single specimen from each of several branch lines of merit. In addition, discussions have been initiated with the ecclesiastical authorities with a

### LIVERPOOL LOOKING UP

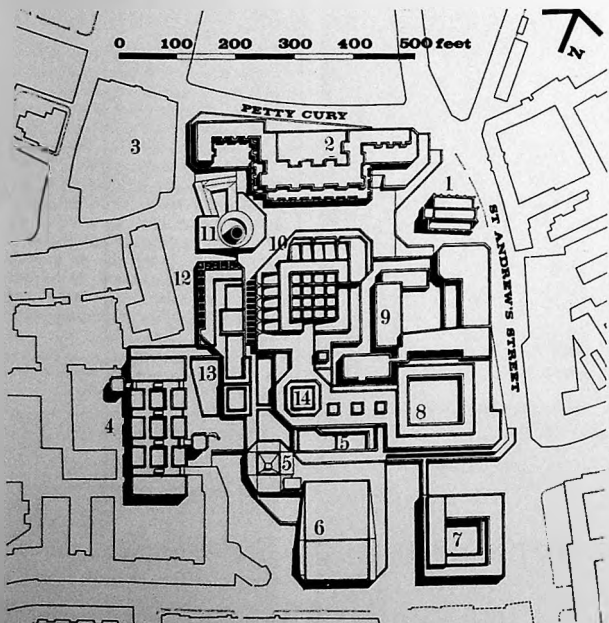
In London the disastrous effects of indiscriminately placed high buildings are only too evident and show the desperate need for a really effective and imaginative planning policy; a policy to ensure that such buildings go where they will reinforce townscape, not destroy it.

A recent report published by the Liverpool city planning department and entitled *High Buildings Policy* is therefore welcome as perhaps the first serious attempt by a major city to get to grips with the problem; to decide where its high buildings should go rather than fight an incessant rear-guard action against them. If the system described really works, such visual disasters as London's Park Lane Hilton will not happen in Liverpool.

This is an easy to read booklet directed at the potential developer and seeks to guide him into submitting the kind of scheme likely to meet with planning approval. It takes the trouble to explain why, for instance, tall blocks are welcome in one position and not in another, and illustrates the point by showing the likely effect on skyline views from the river and the main vantage-points inland.

The topography and structure of Liverpool is simply explained, and maps show 'clear' zones where tall buildings will be encouraged, 'prohibi-

1, plan of the Lion Yard development, Cambridge. Key: 1, St. Andrew's Church. 2, flats and shops. 3, Guildhall. 4, new science building. 5, small hall. 6, large hall. 7, hotel. 8, department store and offices. 9, Post Office buildings. 10, library. 11, Fisher House. 12, YMCA. 13, arts centre. 14, music school. 15, international centre.





view to amending the legislation which at present exempts churches from local authority planning. A High Court judgment last year by Lord Denning extended the definition of 'an ecclesiastical building which is for the time being used for ecclesiastical purposes' to cover vicarages and other such domestic church-buildings. As the Victorian Society report says, 'the potential effects of the decision are obviously appalling. St. Mary's Training College could pull down Strawberry Hill; the convent which occupies it could destroy the noble Pantheon at Ince Blundell Hall; the Jesuits could annihilate Salvin's masterpiece at Harlaxton.' The Church of England argues in reply that it has its own legal system of faculties and diocesan advisory committees, but these cover churches only in the narrow sense and few of the committees show any understanding of Victorian churches (often the majority of those in a diocese). Whitewash is still regarded as the universal panacea against polychromy. The Roman Catholic and Free Churches are entirely outside the law. The Victorian Society suggests that increasing demands for the State to give financial assistance to historic churches, as it does to secular buildings, should be met with a reciprocal demand for normal and reasonable planning controls.

#### DO-IT-YOURSELF BUCHANAN

While official circles seem to have virtually shelved the Buchanan report—the Minister of Transport's recent article in *Traffic Engineering and Control* concentrated entirely on 'extracting the utmost (for the motorist) from the existing streets'—frustrated environmentalists are turning to the kind of local guerilla action which the Professor himself has done much to encourage. In June, a public inquiry into a Greater London Council compulsory purchase order for a 3-acre housing site in Islington found itself presented for the first time by the objectors with a fully developed proposal for an 'environmental area,' with traffic separation and servicing arrangements carefully considered. One of the Buchanan team appeared as a star witness on their side. The area in question is Barnsbury, one of the finest areas of Regency and Early Victorian terraces and squares in London. It adjoins the more fashionable, but in fact less beautiful, Canonbury area, and is clearly outlined by Caledonian, Pentonville and Liverpool Roads on three sides, and by the railway on the north.

The Barnsbury Report was prepared for the Barnsbury Association by a local architect-planner, David Wager. The heart of his proposed environmental area is a sequence of squares for pedestrians only from Cloudesley Square (with its Barry Church) to Lonsdale Square (Gothic, by R. C. Carpenter) to Barnsbury Square (Cubitt). These would be connected by a pedestrian shopping precinct along the present busy through route of Thornhill Road. Within the rectangle of main roads carrying through traffic, local distributors would lead into off-street parking and servicing areas. The five local schools would have the safe access they lack at the moment. All this could be done for

the cost of a few bollards and signposts, apart from the car parks; however, the Barnsbury Report also gives positive illustrations of how new development such as the GLC proposes could harmonize in scale with and enhance the Regency environment. The GLC pleaded at the inquiry that they had neither the men nor the money to prepare a comprehensive plan themselves before redeveloping sites piecemeal at a higher density (for the praiseworthy purpose of hastening slum clearance elsewhere). It will be interesting to see what the Minister of Housing's reaction is; whatever he says, the citizens of Barnsbury will have their bollards ready.

#### BUCKLERS HARD

Ever since the war the tiny eighteenth-century shipyard village of Bucklers Hard on the Beaulieu River has been fighting a desperate battle to survive the fate of all beauty spots—slow suffocation by success: . . . the miniature grass-grown street choked with Jaguars; hedges used as urinals; temporary shackery staying up too long; litter and noise and petrol fumes. This summer the defenders—Lord Montagu, on whose estate the village stands, and his professional advisers—disclosed a major, even perhaps a permanent, victory on the eve of what had seemed to be inevitable defeat. The rusty old sheds of the shipyard have vanished for ever (it is a romantic myth that boatyard mess is acceptable; these days it is not very different from that of a suburban garage), the car-parks have been discreetly and tidily resited clear of the village, the shacks

have been less obtrusively replaced, public lavatories provided, a new village shop inserted into a cottage, and, best of all, the main street is for ever closed to cars.

'The motor-car,' said arch-motorist Lord Montagu at an inaugural dinner given in the remodelled pub to his tenants (of land or water) 'must be tamed.' Limited access to the water (for transferring heavy gear to and from boats) is allowed, but leaving your car at the pier will cost you £5 a day until you move it. All boats must be licensed, river speed-limits will be enforced, water-skiing confined to areas where it will cause the least annoyance to others. The result? A model of how to do that most difficult of things: enable the maximum number of people to enjoy themselves without spoiling the pleasure of others. H.C.

#### CHURCH MUSEUM

It has often been said in this country that unwanted churches might be used for museum purposes. But there are still very few examples. The Schnütgen Museum at Cologne, illustrated here, 3, is an exemplary case and should be studied by the architects' departments of all cities.

It was as long ago as 1867 that Canon Schnütgen began to collect works of medieval art ejected from the churches of Cologne and the Rhineland during restoration. He got together a collection of exceptional size and quality and in the end presented it to the city. The director of the museum added to the collection and in 1931 combined it with the

section of medieval sculpture in the Wallraf-Richartz Museum. After war, the present director, Dr. Schnitzler, re-arranged the Schnütgen Museum in the Romanesque church of St. Cecilia. The architect in the war was Herr K. Band.

The ecclesiastic character of the building was deliberately played down so that the objects might not be swamped by it. Small pieces were arranged on the gallery above the aisles whose arches were closed for purpose, and in the Gothic west. A new, frankly modern but discreet addition, 4, serves as the entrance for more exhibits and has administrative offices above.

#### HISTORIC BUILDINGS POSTSCRIPT

Since the publication in the August AR of the article by Mr. Antony Dale on legislation affecting the preservation and listing of historic buildings in various countries, Mr. Dale has been able to furnish similar information about the situation in the United States of America. The following is therefore a postscript to the August article.

Federal legislation for the preservation of historic buildings in the United States is largely confined to their survey or registration. The Historic Sites Act of 1935 empowered the Secretary of the Interior to 'make a survey of historic and archaeological sites, buildings and objects for the purpose of determining which possess exceptional value as commemorating or illustrating the history of the United States.'

The field of American history and pre-history has been divided into 22 major themes. On the basis of these themes sites and buildings are selected by historians of the National Park Service and submitted to the Consulting Committee for the National Survey of Historic Sites and Buildings and subsequently to the Advisory Board on National Parks, Historic Sites, Buildings and Monuments. The Advisory Board recommends to the Secretary of the Interior the final selection for registration.

These must be structures or sites of secular character which are connected with outstandingly important events, persons, ideas or ideals in the nation's history dating from more than 50 years beforehand; those which embody the distinguishing characteristics of an outstandingly important type of architecture or architect; or, in the case of archaeological sites, those which are productive of outstandingly important information. Every site or building chosen must have integrity in the sense that it is substantially intact and genuine. Buildings of religious signifi-



3, the Schnütgen Museum, in the church of St. Cecilia, Cologne. 4, the modern addition housing the entrance hall and offices.



finance, birth and burial places are not included.

The National Survey is gradually being published and when completed by 1966 will comprise sixteen volumes. In addition authoritative studies of individual items in the Survey are published from time to time.

Historic sites and buildings cannot be acquired by the Nation without an Act of Congress. On the advice of the Advisory Board on National Parks, Historic Sites, Buildings and Monuments some sites and buildings have, however, been so acquired and are administered by the National Park Service. In his selection the Minister of the Interior is guided by the considerations that the site or building must stand out in national significance; that it is needed to fill a gap in a theme or period amongst those already acquired; that it is suitable for effective preservation and use, and that its acquisition is feasible in terms of finance.

By 1960 it was recognized that the number of sites or buildings which could be acquired was only a very small proportion of the total. The Registry of National Historic Landmarks was therefore instituted to recognize and encourage the continuation of efforts for preservation being conducted by State, local and private agencies and to call attention to those sites of exceptional value that need to be preserved.

Potential National Historic Landmarks are selected by the same process as all the Historic Sites and Buildings included in the National Survey. The Director of the National Park Service then approaches the owners of the sites to invite their co-operation. This is entirely voluntary, and they may refuse. But if they accept they must agree to preserve the historical integrity of the site or structure and to use it for purposes consistent with its historical character. When an owner accepts these obligations he is issued with a certificate of the status of the site and a bronze plaque to be affixed thereon, and the landmark is entered in the National Registry Book.

This process provides encouragement and recognition to the numerous state organizations, patriotic groups, historical societies and private individuals who, in America, have been the agencies securing the preservation of historic buildings.

#### MORRIS WINDOWS APPEAL

St. Michael's Church, Brighton, a superb High Victorian church built in two parallel halves to designs by Bodley and Burges, has some of the finest of all Morris & Co. glass in the Bodley half, built in 1861-2. The four windows were the firm's first large job and include designs by Burne-Jones, Philip Webb and Madox Brown as well as by Morris himself. Being on the south and west walls at the top of an exposed seaside hill, the glass is now in a serious state of disrepair. Releading and repair of cracks will cost about £1,500 and, since £15,000 has to be spent on the rest of the fabric, the parishioners feel justified in appealing for outside help, in view of the national importance of Morris's work. Contributions, marked 'Morris Windows Appeal,' should be sent to the Rev. F. O. Taylor, St.

Michael's Vicarage, Windlesham Gardens, Brighton 1, Sussex.

#### TRIUMPHAL ELEPHANT

The French volume of engravings from which the illustration on the cover of the July AR was taken is to be found not in the Bibliothèque Nationale, as stated in the issue, but in the archaeological library of the Paris Academy (Jacques Doucet Foundation).

### correspondence

#### ON FROM KAHN

To the Editors.

SIRS: Just noticed your very square comments on our Cornell Laboratories ('World,' AR, June 1965). I thought social realism as a measure of architectural works had died a deserved death in the 'fifties. You are entirely correct in suspecting an art for art's sake attitude. Art which serves another cause but its own is not art but propaganda. The measure of architecture is appropriateness. An integral solution is highly desirable but not always feasible. Corbusier builds buildings within buildings. Screens to manipulate space and light, nothing else.

Since you hold technical brilliance in such high esteem, you might have noticed that the elements you refer to as 'pilasters' are, in fact, columns supporting a long span concrete floor system. How about kicking the pseudo-scientific habit? You can make it.

Yours, etc.,

ULRICH FRANZEN

New York.

If Mr. Franzen is worried about squareness, he could cite his own support of an attitude popular in 1890. At least he agrees with us that his sculptured brickwork is not 'an integral solution' with the laboratory spaces within (which we praised). If his columns are actually columns, why make them look like pilasters (a point precisely made in the article)? Needless to say, we should deprecate 'pseudo-science' quite as much as pseudo-art. AR Editors.

### book reviews

#### LEASEHOLD LONDON

TOWN PLANNING IN LONDON: THE EIGHTEENTH AND NINETEENTH CENTURIES. By Donald J. Olsen. Yale Historical Publications: David Horne, Editor. Yale University Press, New Haven and London, 1964, 90s.

This is an excellent, important book, not only for planners, and very well written. It describes the sort of town planning which the ground landlords of London, during two centuries, tried to carry out on their estates, how they went about it, and what the effects on London were and still are. Other great cities in the world have been composed of many small freeholds; only London was, and to a certain extent still is, divided among the owners of a comparatively few large estates. Leasehold history and London history are therefore almost synonymous. Both in plan and elevation, much of our London was drawn up in these landlords' offices.

The author selected for attention two estates, geographically contiguous, which differed in the nature of their ownership, the ducal property of the Bedford Estate and the corporate charity of the Foundling Estate, with supporting evidence from the Westminster, Northampton, Portman, and other estates. Not only was he able to use quantities of estate records, but also the volumes of testimony on estate management from governmental enquiries held during the 1880's when the whole idea of leasehold was being questioned (and when so many late-eighteenth-century leases were falling in). The development of the Bedford lands in Middlesex—that is, Covent Garden, Bloomsbury, and Figs Mead north of Euston Station—went on for more than two centuries. The Foundling Estate development took place in a compact area during one generation.

Mr. Olsen takes us through the three phases which he calls building, preservation, and rebuilding—or, building leases, repairing leases, and redevelopment. His lucid narrative illuminates policies and people: the ideal tenants in the landlord's mind and how circumstances modified them; the estate office's relations with the builders, who bore the first risk, and with architects in the days when men like S. P. Cockerell didn't scorn to act as estate surveyors; the business acumen or otherwise of the landlords themselves. Comparisons with the estate histories of Clerkenwell and Somers Town raise the matter of slums.

Mid-Victorian estates, when well run and laid out, were no help to the larger community in housing the increasing numbers of the poor: good estate design and management, then, meant slums somewhere else. Unless the middleman, the absentee lessee with weekly sub-tenants, got in; he is no new problem. The author is careful to distinguish between slums and the seedy results of inevitable deterioration of property with time and changes in fashion. Being American (he is a member of the history faculty at Vassar College), he compares the *Drang nach Westen* from the City to Bloomsbury to Piccadilly and Marylebone with the march of the frontier in the American West.

As an example of an estate owner's attempt to hold the clock back, a surprising number of gates were installed by the Duke of Bedford—five on the northern edges of Bloomsbury—to keep out low traffic and preserve the amenities of his new squares. Hated by cab-drivers and their passengers for Euston and King's Cross over two generations, these were finally abolished by the LCC, symbols of segregation in the interests of the reversion value of leases. The former existence of these gates explains the little lodges still standing on the lower west sides of Tavistock and Endsleigh Streets; the Bedford Estate Office has kindly confirmed a hunch that these were, indeed, gatekeepers' lodges. (A footnote for a future edition of the 1949 Survey of London volume, as well as for Mr. Olsen.)

The problems of renewal—when the original houses, or their original uses, are worn out—involves the thorny matter of Preservation with, these days, a large P. Mr. Olsen

describes the dilemma judiciously in its various aspects and leaves it with an open mind. However, no architectural historian will agree with him that Henry Clutton's rebuilt north-west block of Inigo Jones's Covent Garden Piazza is a 'careful reproduction.' Altering overall height, the proportion and number of storeys, and the character of external detail can only be called 'approximation.' It would have been interesting to hear how Admiral Russell's house next door, almost certainly by Thomas Archer, fitted 1700 and not entirely gone yet, fitted into the Bedford development scheme. But the Survey of London will be looking into that, and Mr. Olsen did not set out to be biographer of individual buildings.

As they say at Leicester, local history is the origin, growth, decline, and fall of a community (Darwin plus Gibbon). This book describes the origins, growth, and decline of several once autonomous, increasingly intermeshed, still lively and cussed organisms which help to make the Greater London Organism what it is. PRISCILLA METCALF

#### SECOND SELECTION

WORLD ARCHITECTURE: 2 Edited by John Donat. Studio Vista, 84s.

John Donat's second volume under this title contains as lively a selection of buildings and projects as his first (reviewed AR, July 1964) and will help further to establish it as a useful periodical publication. It remains curiously inconsistent—the result perhaps of under-editing; the contributing editors from the various countries take their own line and put their own interpretation on their duties without much evidence of guidance from the centre, which makes for variety but makes it difficult to fulfill the general editor's expressed intention of writing about architecture in terms the layman can understand. This rather lackadaisical attitude also gives no picture of how architecture is developing in the countries dealt with because there is no indication of whether the projects chosen for illustration are typical or freaks. The title of the series thus becomes something of a misnomer.

There are certain oddities: photographs of an interesting new Japanese building by Kiyonori Kikutake at Izumo Shrine are preceded by an article on the aesthetic philosophy of the Shinto shrines, but the shrines themselves are not illustrated and it is not made clear that Kikutake's building is not itself a shrine but a library and treasure house recently erected in the grounds of the Izumo Shrine; and there are perhaps too many projects that will already be well-known to Mr. Donat's architect readers: Scharoun's Philharmonie in Berlin, for example, Tange's 1960 plan for Tokyo and Johansen's U.S. Embassy in Dublin.

Nevertheless the volume contains much noteworthy and stimulating material, including a fascinating study by Julian Beinart of do-it-yourself decorations on the house walls of a native township at Johannesburg. Britain is represented only by a developer's project—albeit an unusually enterprising one—for the Victoria Station site at Nottingham.

J.M.R.

Lionel Brett

# THE DEVELOPERS

Ever since—well, the Middle Ages, certainly—middlemen have been generally resented and occasionally persecuted, for the simple-minded reason that they intervened between makers and users, between the respected world of imagination, enterprise, skill and sweat and the great body of consumers. Resentment came from both sides, from agriculturists who saw the price-tag on fruit it had hardly been worth their while to pick and from hungry people forced into black markets in times of scarcity. For the middleman scarcity meant big business, and this hardly improved his image. It was hard for a rich man to enter the Kingdom of Heaven, particularly if he got rich exploiting the basic necessities of life.

Of which necessities, shelter is one: no problem in England until the population explosion of the nineteenth century and the wars of the twentieth. The first was the age of the slum-landlord; the second is the age of the Developers. Over 3 million London houses were destroyed or damaged in Hitler's war, and nearly 20 million square feet of office space, and it was into this derelict region that the population poured from the unwanted war industries of the north and west. It was a golden opportunity, and the way the Developers rose to it is clearly recorded in a recent book by Mr. Brian Whitehouse.\* For the social-democrat reader, this is a peep through the other end of the telescope. Even the title of the book is a mild shock. Conditioned by the Ministry of Housing and Local Government's propaganda for partnership between local authorities and private enterprise, one assumes *Partners in Property* to mean just that. In fact it means the partnership between speculators and insurance companies. Similarly, the 1947 Development Charge is 'one of the most important single

factors in retarding the realization of the enormous redevelopment potential after the war.' The 1957 Rent Act was 'widely acclaimed by property owners of all classes, combining as it did not only equity with foresight. . . .' The abolition of building licensing in 1954 was 'a great day for the property world.' These are the Janus-faces of truth.

The story is the classic one of the great modern service industries, with its three sharply differentiated phases. The first was the phase of the colourful pioneers, of the 'plum' sites on West End thoroughfares picked up dirt cheap at the height of the blitz or the depth of post-war depression and offered at bargain rentals to the only building agencies (bombed-out government departments and top-priority export industries) who could offer or obtain the privilege of inhabiting new offices. This was when the great names—Louis Freedman, Charles Clore, Jack Cotton, Max Rayne, Lew Hammerson, Harold Samuel—made themselves. Looking back, it seems easy money, as it always will, though only a handful of people saw it at the time.

The second phase, now perhaps near its end, is the phase of tough competition, dearer money and narrower profit margins. The industry becomes professionalized. In this case, the need for ever vaster investment brought in the big life insurance offices and the pension funds, with their sharp financial appraisals and total blindness to wider considerations. This is the phase in which capitalism develops its private languages and the mystiques which make it seem too difficult for amateurs. Finally, and still ahead, comes the third phase, when a service is seen to have such immense social ramifications that the question arises whether financial criteria should be its sole motive force. Cost-benefit analysis casts a

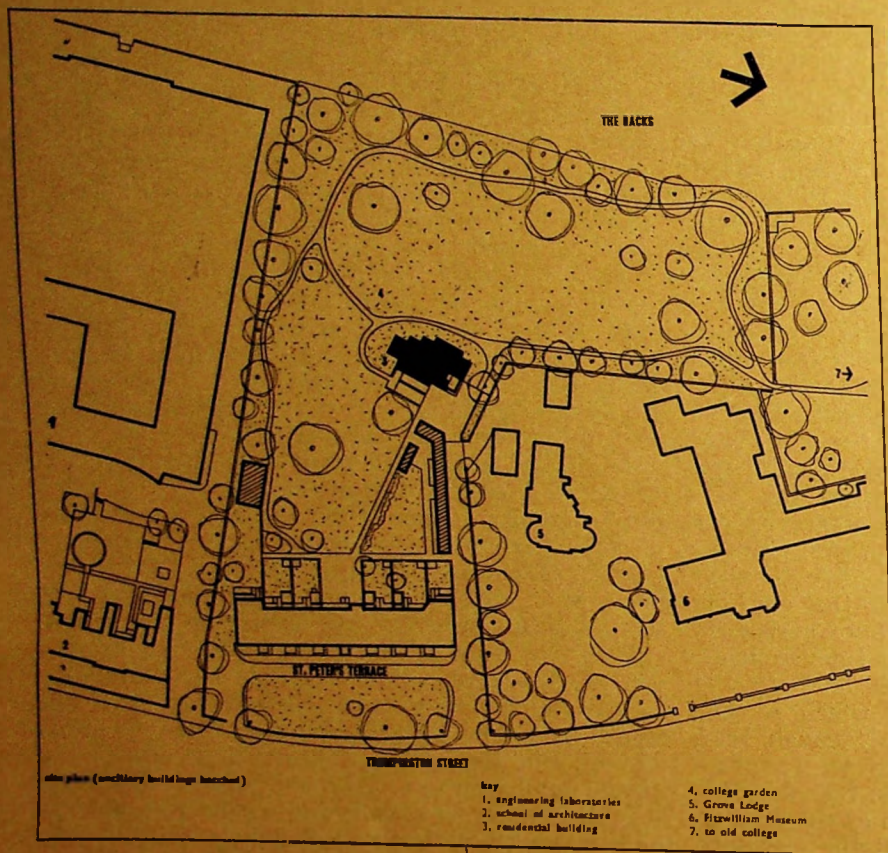
\* *Partners in Property*. By Brian P. Whitehouse. London: Birt, Shaw & Co. 68s.



# RESIDENTIAL BUILDING, PETERHOUSE, CAMBRIDGE

photographs by Brecht-Einzig

architects **SIR LESLIE MARTIN AND COLIN ST. JOHN WILSON**



## criticism

Even more so than their Harvey Court for Caius (AR, November, 1962) Professor Martin's and Mr. Wilson's massively modelled brick monolith for Peterhouse has become part of the intellectual make-up of a whole generation of students at the Cambridge School of Architecture (the Scroope Terrace premises of which are a stone's throw from it). It is in the most literal sense a didactic building, part of a curriculum. It breaks clean away from the medieval courtyard tradition that has tended to overburden Cambridge's three new colleges (and, for that matter, Harvey Court); but this point block is hardly the sort that Sir Leslie's admirers would have expected when he moved to Cambridge from the LCC with its Brandon-Roehampton team. The influence of Aalto's *Pensions Institute* and, even more, of Louis Kahn's recent service stacks has been fused into a geometry of brickwork which seems rooted in the English tradition—and it is, incidentally, the only tradition of geometry that the English builder can as yet be relied upon to execute impeccably. (It is ironic that it should be called the Stone Building.) As a result, the Peterhouse tower is one of the few post-war English buildings where the visitor is not constantly jerked

into irritation by minor details but can stand back and enjoy architecture in the purest sense. Elimination of the irrelevant and integrity of modelling are the vital part of the present Cambridge teaching. On the other hand, it can lead to an over-concentration on producing Great Architecture; it would be unwise for the student to think that the Peterhouse building represents the facts of everyday life. It is not cheap, being the result of a massive legacy from the centenary 'Squire of Albany' (in memory of happy years at the college in 1875-78). In view of its monumentality, it is a little difficult sometimes to remember that it houses only 24 students and 8 dons. No less rigorous intellectually than Harvey Court, the William Stone building shows a much greater understanding both of its site and of the needs of students. Every aspect of its design seems integral with the requirements of function and siting; there is none of the applied collegiate veneer, for example, of Saarinen's Morse-Stiles Colleges at Yale, which have a similarly romantic environment. Whereas Harvey Court had to assert defiantly a sense of community among suburban gardens, Peterhouse is within the historic centre. A tower was undoubtedly right in this position. It stands sentinel at the southern end of the Backs and effectively dominates the adjoining utilitarian bulk of Easton and Robertson's

engineering laboratories. If anything, it should have been two or three storeys higher; from the Fen Causeway bypass it appears too much as a slab and too little as a tower. Its visual function as a link between St. Peter's Terrace and the old college is effortlessly handled, whether in the approach road with its counterpoint of long stock-brick garden wall to tall lift tower (similar to the 'chimney' at Jesus College) or in the park-like garden which flows around its base without a break. The geometry of the entrance side is superb, with the verticality of the lift tower locked firmly into the building and the inset doorway focused diagonally by the stepped plinth. Only when seen full face from the garden does the building appear curiously squat and ungainly, extra storeys being needed to overcome the powerful horizontal movement of the continuous fenestration.

The idea of multi-storey buildings in load-bearing brick has been comparatively novel in recent years, although there are even taller blocks of flats in brick by Madin in Edgbaston and by Stillman and Eastwick-Field in Lambeth. Given the decision to spend lavishly on lifts and services (eight storeys is about the most uneconomical height that can be devised for a tower), the use of brick is a sensible economy. It also provides excellent sound insulation which preserves optimum conditions for study while a record-player is blaring in the next room. Unlike Caius, Peterhouse has supported its architects in their choice of furnishings; the rooms are light and harmonious, with their white walls outlined in timber. The architects have clearly fought for every detail: for example, the tubular light fittings which are welded directly to the tubular newel post of the staircase, or the hooks for the window cleaning apparatus which are adapted as bases for stools on the roof terrace. The internal arrangements are a great remove from the enforced sociability of Harvey Court or the enforced seclusion of some of the other new college buildings. The privacy of the rooms is conditioned partly by the blurred view of one's neighbour through the metal louvres, but mainly by the generous lobby space, which opens in reverse echelon to a kind of ante-room, with a window seat giving a piquant view over the Fitzwilliam Museum towards the old college. Originally the architects intended this view to be aligned on the side door of the medieval hall, but the proximity of the extensions to the engineering laboratories now being built to the south forced them to swivel the building slightly. One of the best features is the clear link, by a brick-paved pathway lined with garden walls, to the white bay windows of the common room in St. Peter's Terrace. In their honest suburban relationship with the garden and with the old college and in their superb views over the trees and cupolas of Cambridge, these civilised flats suggest a new independence and freedom in student life.

N.T.

1 (facing page), the approach to the entrance from Trumpington Street.





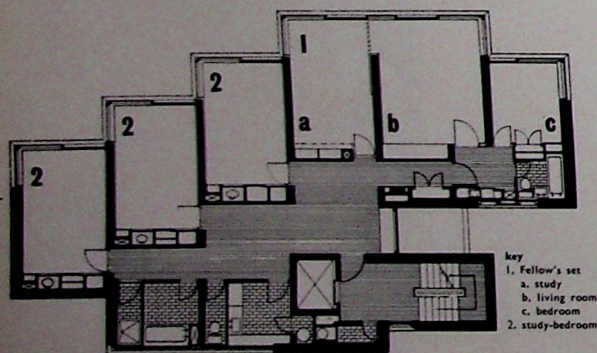
# BRICK MONOLITH



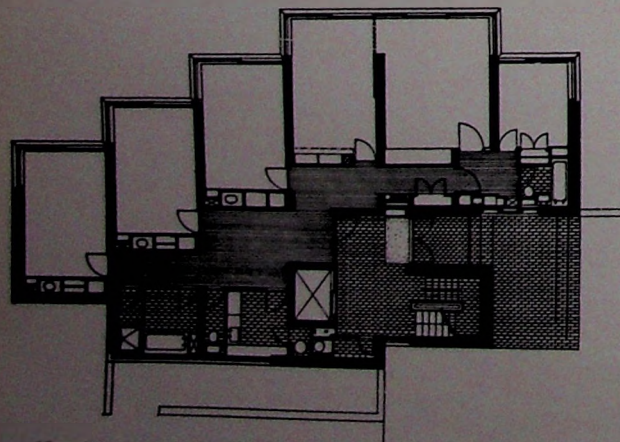
The William Stone Building is an eight-storey tower of irregular shape. It stands to the south of the college's ancient buildings, at the far end of the former deer park, and adjoins the back garden of St. Peter's Terrace, an Early Victorian row of houses recently incorporated into the college. It was decided not to adopt a courtyard plan, but to erect an isolated tower which would visually connect the terrace and the college, with the minimum of disturbance to the landscaped garden flowing round it. Meals are provided in the main hall of the college, but there is a common room in St. Peter's Terrace for the 75 residents of the two newly acquired buildings. The planning of the block resembles a human hand, with the service rooms and lift tower in the palm, facing towards St. Peter's Terrace and the approach road, and the five rooms on each floor facing out across the garden and the river. The rooms are arranged in echelon, with a broad west window for the view, and a narrow south window for sunlight (this has fixed polished metal louvres to ensure privacy). On each floor there are three bed-sitters for undergraduates, with built-in cupboards and basins, and a set of two rooms which can be used either by a Fellow of the college or by two undergraduates (the double-size living room is

2

2. the windows of the study-bedrooms seen from the south. 3. one of the louvred study-bedroom windows. 4. interior of a Fellow's set. 5. brick-paved court and steps leading to the main entrance.



typical upper floor plan

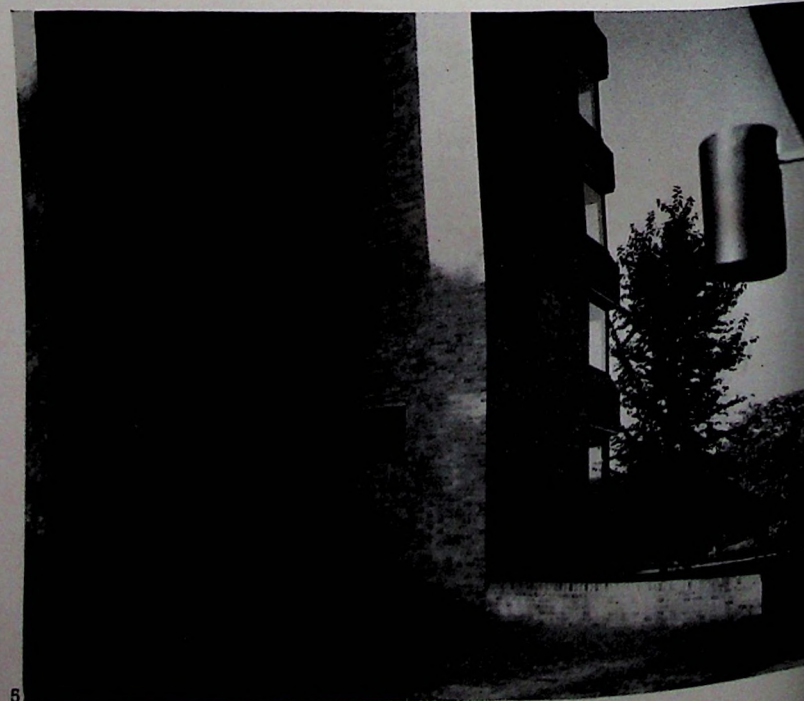


ground floor plan

3



4



5





6, from the college gardens, with the Fellows' sets on the left and the staggered study-bedrooms on the right.

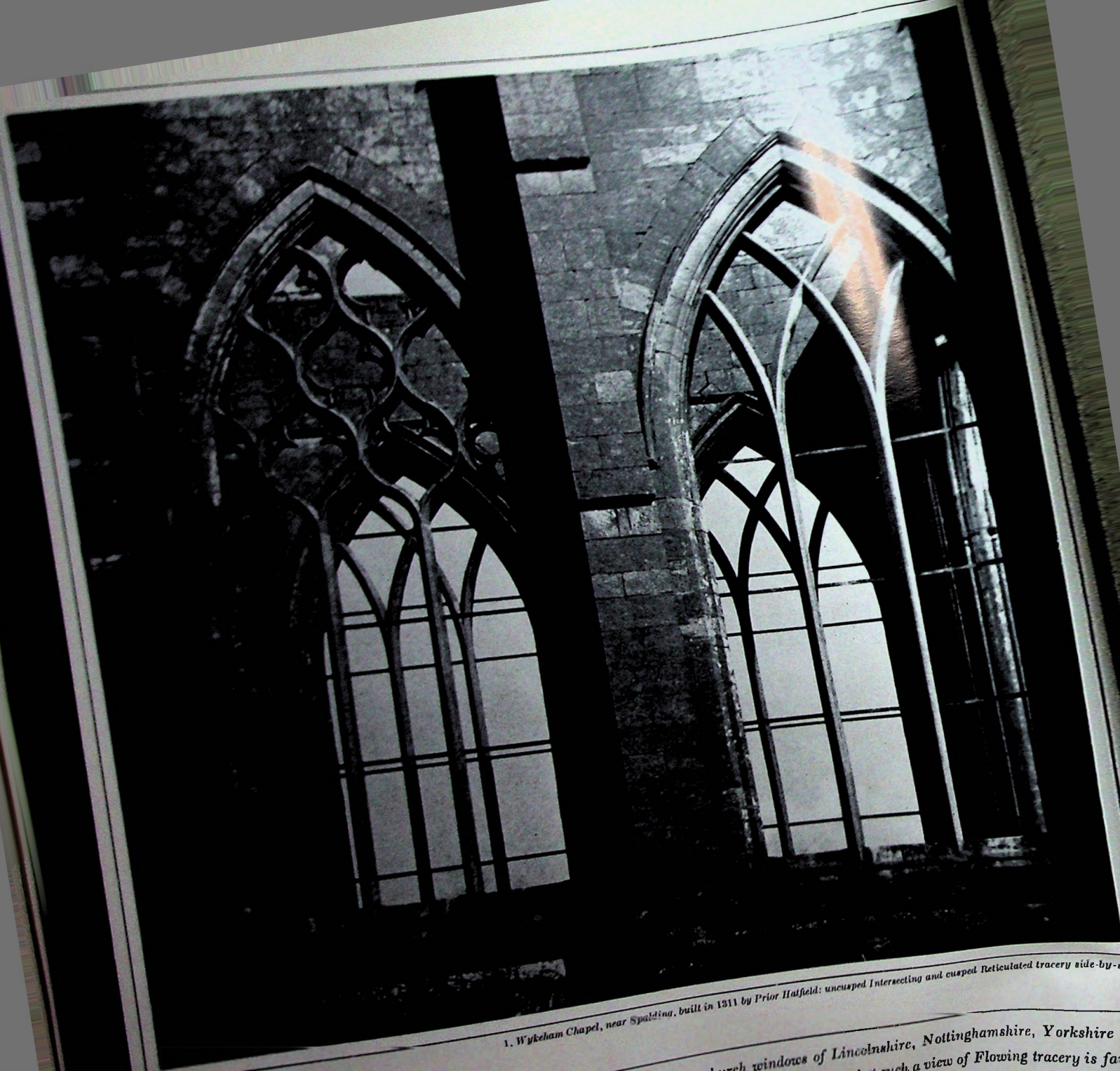
virtually divided in two by a wall and a sliding door). On the other side of the landing are the shower room, bathroom, lavatory, kitchen, refuse disposal chute, staircase and lift. This is the first residential building for a Cambridge college that has a lift.

The structure is almost entirely of load-bearing brick with cross-walls between rooms, external cavity walls around the services and solid brick for the staircase tower. The facings are of brown Stamfordstone brick. Floors are of reinforced concrete. The paved roof-terrace has a deep parapet fascia of lead-coated copper. There is a half-basement for storage purposes, which

explains the grass bank raising the building above the level of the lawn. The splayed windows have frames of teak with double glazing and aluminium sliding opening lights. The furniture includes pieces by Race and Ryman chosen by the architects and a divan bed designed by Richard Burton. Heating is by an electric low-temperature radiant ceiling-panel system and water is also heated by electricity. Close to the entrance is a timber-framed bicycle shed.

Principal assistant, B. G. Jones. Structural engineers, Felix Samuely and Partners. Quantity surveyors, Monk and Dunstone.





1. Wykeham Chapel, near Spalding, built in 1311 by Prior Hatfield: uncusped intersecting and cusped Reticulated tracery side-by-side.

Those who remember the Flowing tracery of the great early fourteenth-century church windows of Lincolnshire, Nottinghamshire, Yorkshire and other counties think of it as the nec plus ultra of freely running fancy. This article was written to prove that such a view of Flowing tracery is faulty. The Geometrical tracery preceding it and the Perpendicular tracery following it were both largely standardized. Nothing of that kind can be expected in the Decorated style, but Mr. Etherton has, by a close investigation of several hundred windows, made a good case for at least a considerable degree of standardization. That the discovery had to wait so long is due to the curiously slack state of research into English Gothic architecture. In fact most of the literature which was of use to Mr. Etherton in his researches dates back to about 1840-50—chiefly the books of Edmund Sharpe and E. A. Freeman (by Sharpe, a treatise on The Rise and Progress of Decorated Tracery in England, 1840; by Freeman A Collection of Decorated Tracery Examples, 1850, and An Essay on the Origin and Development of Window Tracery in England, 1851). Mr. Etherton has chiefly worked in Lincolnshire, but the examples which he uses for substantiating his claims are taken from other counties also.



# THE MORPHOLOGY OF FLOWING TRACERY

David Etherton

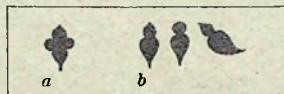
Geometrical tracery—foiled circles above lancet lights—was invented at Reims about 1210–20 and taken over at Westminster Abbey, 2, in 1245. Amiens about 1240 used it above four lights. Westminster about 1250 did the same, and the Angel Choir at Lincoln, 3, has a superb eight-light east window of c. 1280. Geometrical tracery has a consistency which is often missing in later windows, but imposed a severe limitation on freedom and variety. When the Decorated style replaced the Early English from about 1290 onwards, this was increasingly felt, and one result was Flowing tracery. The hallmark of Flowing tracery is the ogree curve, 'invented by Beelzebub for the frustration of pure art' (Ruskin). The purpose of the following survey is to analyse how far designs, that at first seem fanciful, follow a system.

Throughout the survey a distinction is made between the framework, i.e. the principal divisions of the tracery made by a continuation of the window mullions, and the decorative infilling, the foliation of the interstices. The two most easily recognized fourteenth-century framework divisions produce what is known as Reticulated and Intersecting tracery (shown in 1 on the facing page). Reticulated tracery consists of rows of circles, drawn at top and bottom to form a net of ogree vesicas. It is an indeterminate system which leaves clumsy frayed edges where it meets the curve of the window arch, and it is interesting that such a bad solution should have been so popular. Reticulation can be seen almost anywhere in England and it was this 'off-the-peg' pattern which was chosen by the French as a generator of Flamboyant tracery.\*

Intersecting tracery is produced by branching each mullion into two curved bars, all these bars running concentrically into the window arch. In this form it is still pre-Decorated. But even before 1300 disturbances set in, such as the elimination of the top intersection and its replacement by a circle or quatrefoil or some such shape, 4. Also foliation shapes inside the framework become stretched or squashed or other-

wise made unharmonious until configurations are reached which approximate to reticulation.

In all Flowing tracery the principal shapes are only two: the dagger or soufflet, and the falcion or mouchette. The first is a straight leaf shape with a blunt or pointed head, a pointed tail, and cusped inside, *a*. The mouchette is a curved dagger, *b*. Both of these are directional shapes. They occur in the following directions: divergent, convergent, reversed and interlocked, *c-f*. There are two types of



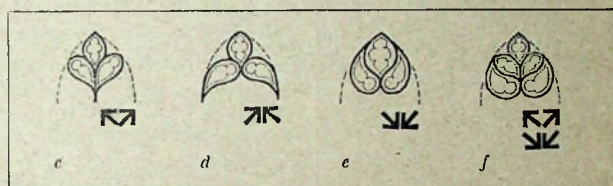
*a*, soufflet (dagger); *b*, falcion (mouchette).

cusps commonly attached to the tracery; the soffit cusps which leaves a clear gap between itself and the tracery, and the chamfer cusps which cheats and only appears from outside to leave a

perforation. The former is a refinement of Geometrical tracery, whereas chamfer cusps are a common detail of Flowing.

The design hierarchy of traceried

the tracery as the panel and the foliation as the final decoration. Each of these elements may contain as many as two orders of mouldings, and in the nineteenth

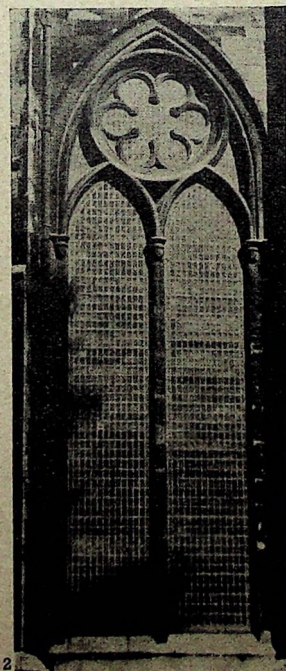


Directional shapes of daggers and mouchettes: *c*, divergent; *d*, convergent; *e*, reversed; *f*, interlocked.

windows is expressed by what the Ecclesiologists called the subordination of mouldings. This means that each part of the window is distinguished by a separate moulding. The window arch can be thought of as the window frame, the mullions and main lines of

century architects were at great pains to analyse and reproduce these often very complex mouldings. It is enough here to say that the junctions between mouldings of the separate parts were ingeniously articulated by means of various checks and fillets. The

2, Westminster Abbey, Choir, c 1245: simple Geometrical tracery—note the roll moulding profile shafts terminating in capitals, and clear distinction between framework and detail. 3, Geometrical tracery in the eight-light Angel Choir east window of Lincoln Cathedral, c 1280.



2



3

\* 'Flamboyant tracery—an architectural exposition of Liberty, Equality and Fraternity, the late watchwords of the nation among whom it attained the greatest prevalence'—Freeman 1880.



subordination of Geometrical windows is very refined and carefully considered, whereas one of the striking characteristics of Flowing tracery is a disregard for all these rules. Roll and edge mouldings are replaced by the simpler surface and fillet profile. Geometrical mullions are often turned into shafts which terminate in carved capitals before joining the

was a subservient craft to that of the mason, and it is unlikely that the colours of stained glass were strong enough to break up the shapes left by the tracery. Most of the shapes were, in any case, quite unsuitable for anything other than abstract patterns or medallions. This situation was reversed with the creation of the Perpendicular Style, when tracery was specifically divided into rectangular panels to frame the stained glass figures.

Before proceeding to the analysis which is the main object of this article, attention must be drawn to the fact that the analysis is largely confined to Lincolnshire. Lincolnshire and the surrounding parts of the East Midlands counties appear to have the best examples of Flowing tracery in the country; other counties may have motifs specially characteristic of them, such as the ballflower of Kent and the south-east, known as Kentish tracery, but nationally speaking Lincolnshire remains the centre of stylistic development.

In Lincolnshire itself the best examples of Flowing tracery occur in the southern parts, i.e. Kesteven and Holland, on an east-west line drawn from Boston, through Heckington and Sleaford, to Grantham. The churches of these towns all have windows of superb originality, and the key examples of all the important systems which will emerge from the analysis are to be found here. What is even more remarkable is that the windows in each building have a family likeness which overrides the more arbitrary classification of types. There are few good windows in Lindsey and the Wolds, where the churches are smaller and sizeable villages further apart. Grimsby and the other Humber towns form a separate group with particularly individual windows, and the Isle of Axholme has good examples of Decorated motifs appearing in what are otherwise Perpendicular windows.

## Analysis

In the following analysis the examples of Flowing tracery are grouped into three main sections, A, B and C (indicated by the red diagrams which are Edmund Sharpe's classification). These in turn are sub-divided into groups, indicated by the blue diagrams.

**Scales of diagrams:** the proportion of window-light width to total height varies, but in order to simplify diagrams window-light width is approximately constant. Four different sizes of window are used.

**Location:** comments refer to the place name immediately opposite the figure number. Similar or identical windows are listed under the first name (\* indicates identical windows too numerous to list). The following abbreviations are used to identify counties: BD, Bedford; BK, Berkshire; BT, Buckingham; C, Cambridge; CD, County Durham; CH, Cheshire; CU, Cumberland; DN, Devon; DR, Derbyshire; G, Gloucester; K, Kent; LA, Lancashire; LR, Leicestershire; M, Monmouth; N, Norfolk; NH, Northampton; NM, Nottingham; O, Oxford; SH, Shropshire; SS, Somerset; ST, Stafford; SV, Surrey; SX, Sussex; W, Wiltshire; WL, West Lothian; WK, Warwick; WR, Worcester; Y, Yorkshire. (Places without county abbreviations are in Lincolnshire, apart from Edinburgh.)

This group includes all tracery in which a predominant central motif, shaped like a lime leaf\*, is supported by two detached arches, i.e. arches which do not continue the line of the window arch above their springing, or by intersecting arches. The primary framework makes a graceful and natural division of the window, a quality shared by simple intersecting tracery. The foliage of the interstices, however, is usually arbitrary and ill-considered.

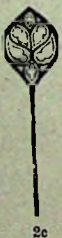
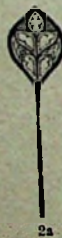
\*Ecclesiastical: vesica piscis, i.e. bladder of a fish. Symbol—virginity. (See Gertrude Jones Dictionary of Mythology and Folklore.)

Four-light windows. A development from Geometrical windows. Circles and arches are now fused into a single flowing shape providing a practical solution to the awkward spandrels of Geometrical windows. The chief variations are in the foliage of side arches and the centre.

A



A1



3

4

5

4, Rosby, east window: Intersecting tracery with the topmost intersection clumsily replaced by a new shape.

racery. In Flowing tracery the same moulding is used to stress the continuity between mullions and racery. Another way of looking at traceried windows is to distinguish the positive and negative shapes. Positive are the lines of the tracery, negative the shapes circumscribed by these lines. In Flowing tracery there is an interplay of positive and negative, but this can only be appreciated from outside, where there is sufficient light to follow the continuous lines of mouldings. From inside it is the crazy jumble of negative mouchettes and daggers which make all the impact, 5. In the fourteenth century, glass painting

5, Southham, Norfolk, west window: from inside, the framework division is suppressed by the explosively negative shapes of daggers and mouchettes.





## A1 continued

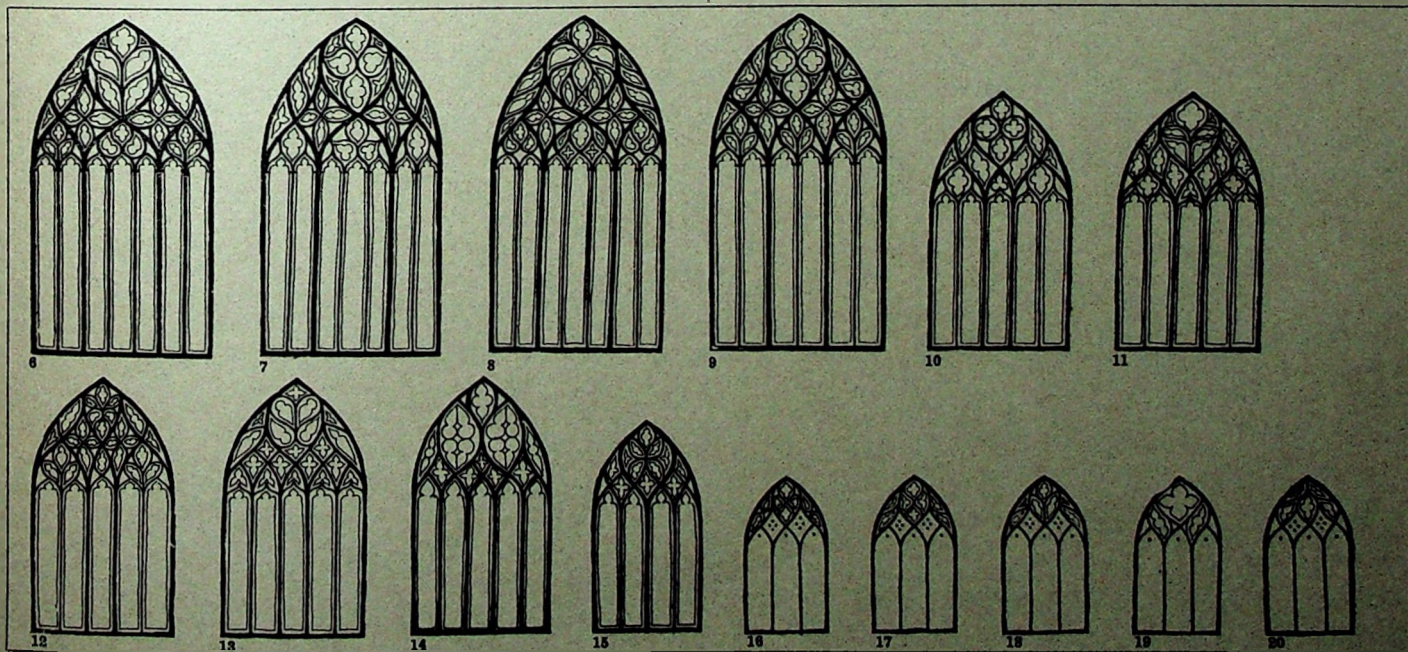
- 1 Supporting arch and spandrel variations.
- 1 a BEVERLEY MINSTER (Y) Lancet lights and circle of the Geometrical tradition, but note the much later *roue tournante* motif of spinning mouchettes and interlocking spandrel detail.
- 1 b FRISBY-ON-WREAK (LR) Lancet lights and simple elongated trefoll. Spandrel detail typical of much later Flowing tracery.
- BOSTON
- 1 c NANTWICH (CH) Framework division of whole window repeated as supporting arch framework. Elaborate spandrel.
- SLEAFORD
- 1 d SLEAFORD More characteristic of Flowing Tracery. Here the termination of the window light is ignored and more emphasis given to a directional arrangement of three mouchettes—'divergent' and 'convergent' cf A1 2a and C4
- SLEAFORD  
YORK MINSTER (Y)
- 1 e HOLBEACH COTTINGHAM (Y)
- 2 Centre Variations. These are numerous and there is rarely an affinity between the design of centres and supporting arches.
- 2 a SLEAFORD Divergent, convergent, reversed, and interlocking groups of mouchettes, the most common types. cf C4
- 2 b BEVERLEY MINSTER (Y)
- 2 c NANTWICH (CH) BRIGHAM (CF)
- 2 d HOLBEACH
- 2 e FRISBY-ON-WREAK (LR) Cheerful and sad varieties of a stem and leaf pattern also fairly common (see York Minster). Note pointed and blunt ended mouchettes.
- 2 f BEVERLEY MINSTER (Y)
- 2 g PRESTON (BA) Four-petal flower or star. Very common.
- 2 h GROUVILLE (Jersey) Inside-out star. Ingenious variation much more Flamboyant in character.
- 2 i WILSFORD Reticulation and variations. Very common.
- 2 j NANTWICH (CH) A very individual variation of simple Reticulation. Unusual opposed symmetry of mouchettes.
- 3 SLEAFORD S aisle A common instance of one side of the supporting arch missing the flow of the centre resulting in simple rather than ogee supporting arches. Ungainly framework and incongruous infill.
- 4 BOSTON S aisle Interesting deviant. Foliation of spandrel is a continuation of the horizontal curve which originates from the central mullion. Unusual counterpoint of primary and secondary mouldings.
- LONG SUTTON
- 5 SLEAFORD Chancel S Spine and head predominate. Superficially this looks like a logical development of 4 towards the type of tracery which has no primary framework. There are no supporting arches. Instead graceful branches from the stem opposed by multi-directional mouchettes.
- KIRTON-IN-LINCOLN

## A2



## A2 continued

- 6-9 A group of very large windows, seemingly the most fantastical in English churches. All have the same framework system but vary in detail.
- 6 HECKINGTON E window c 1330 Both this and 7 have attached shafts and capitals which are characteristic of the date. Spandrel is very neatly divided by an intersecting line rebounding off the window arch back on to the centre. Reversed mouchettes over three central lights. cf C4, 45a.
- ALGARINK E window
- 7 HAWTON (NM) Queer mixture of detail. Twisted Reticulation over central three lights. cf C4, 38.
- E window c 1330
- 8 SELBY (Y) Largest of this group, also the most Flamboyant. Strong directional movement into the centre. Intersecting treatment of central group almost identical to 20. Reversed arrangement of mouchettes over side arches.
- E window 41 ft. 9 in. high 2 ft. lights
- 9 SLEAFORD The 2:2:2 sequence of lights allows the two intersecting ogees to be symmetrical. This gives more emphasis to the already incongruous centre with its Geometrical motif.
- N transept N after 1312 (Sharpe's key drawing for A).
- NEWARK (NM)
- BARROWBY
- 10-13 Attempts at applying the seven-light pattern of 6-9 to five lights. The result is a disintegration of the basic motif of intersection.
- 10 HECKINGTON Framework formed by a pair of intersecting lines originating from either side of the centre light. Centre identical with that of 9.
- S transept S 1850
- DAVENHAM (CH)
- 11 SLEAFORD With supporting arches ogee, the simple flow of 10 is replaced by a more vigorous and agitated pattern. The centre detail is equally perverse and shows a happy disrespect for the standard patterns. It is amazing that such an original window should be repeated. (NB. Sharpe uses this to typify C windows, but it seems close enough to 10 to remain in this group.)
- N aisle W
- CROMWELL (NM)
- EDINBURGH
- St Giles Cathedral
- 12 COVENTRY (WE) The original intersecting motif badly warped here and the scale of infilling detail plays curious tricks. The divergent mouchettes of the side arches are more prominent than the centre, which is wedged between the kite shapes.
- St John's Hospital Chapel
- 13 BRIGHAM (CU) An earlier window between pure Intersecting and Flowing tracery, but interesting as a comparison with the later more wilful designs. Note interlocking mouchettes.
- 14 OUNDLE (NR) The centre of this design is an extraordinary Siamese twin with a strange arrangement of blunt-ended mouchettes.
- S aisle E
- 15 BRANT BROUGHTON With an additional window-light and different emphasis given to the mouldings, this hybrid design could be similar to 14. Centre ingeniously integrated with the middle intersection.
- 16 BEVERLEY MINSTER (Y) The intersecting three-light framework is very common. Foliation of window light heads and kite shapes are identical, and three variations of centre and spandrel are shown.
- WELLS (SS)
- SILBY (LR)
- WARDINGTON (O)
- 17 OXFORD Christ Church
- 18 LINCOLN St Peter-at-Gowts
- 19 STONE BRUERN (NE) Reminiscent of 10 and 11. Many similar small windows.
- 20 MOULSFORD (BK) Almost identical to the central three-light group of 8. Unusual in that the central motif does not coincide with the top of the window arch.





B



These windows have an odd number of lights which are divided into distinct compartments. There are more examples of this than of any other type of Flowing tracery. There are no geographical restrictions to this type (cf A2) and it seems to be the most popular framework pattern for Victorian copies. B windows, generally, are the least distinguished of all Flowing tracery. The rigid framework imposes too much of a limitation.

B1



Mainly three- and five-light windows divided into three compartments. The two side arches are equal and their outer edges take the line of the window arch. The division naturally focuses attention on the middle light which visually forms part of the centre. This club-like shape contains the predominant motif, the variants of which are the only object of interest here. Only rarely does the foliage of the side arch have a family likeness to the centre.

B2



The line enclosing the centre compartment reverses before it meets the window arch, leaving a spear-shape in the centre and one edge of the side arch ogee.

B1-22

21 a-c

- a GEDNEY
- b FLEET
- c FLEET
- d S LEVERTON (SM)
- e AUNSEY

Side arch variations: A and B side arches have similar infill.

The termination of single lights in three-light windows.

Rounded window light with blunt mouchette or circle.

Trefoiled spheric triangle on ogee.

Simple trefoil over loose ended ogee.

Convergent mouchettes.

Squashed reticulation.

22 a-d

- a ROMAN (C)
- b PATRINGTON (Y)

Five-light windows. Standard directional grouping of mouchettes—very common.

Reticulation, usually with a different centre. Bristol Cathedral's window has this in the three-light side arches.

## B2 continued

23 a-i

- a GRANTCHESTER (C)
- b SNETTISHAM (N)
- c ATTLEBOROUGH (N)
- d WINCHELSEA (SX)
- e CAR COLSTON (NM)
- f WYMLINGTON (BD)
- g FENKIRIDGE (ST)
- h FLEET
- i BOLBEACH
- j HASLINGFIELD (C)
- k GEDNEY
- l BILLINGBOROUGH
- m BARNWY
- n TRENT (DR)
- o STOKES ALBANY
- p OT MARLOW (BU)

Variations of divergent and reverse mouchettes are common. The difference of emphasis given by the direction of the mouchettes is interesting.

An unusual example of divergent mouchettes.

A line extended down from the top of each side arch and crossing to form the head of the central light. A very common secondary framework for the divergent motif. Formerly used to frame circles, quatrefoils, 'Kentish' motif, etc.

- 1 FLEET
- 2 FLEET
- 3 HALLATON (LR)
- 4 S LEVERTON (NM)

Reversed mouchettes give a downward movement in opposition to the general flow of the tracery.

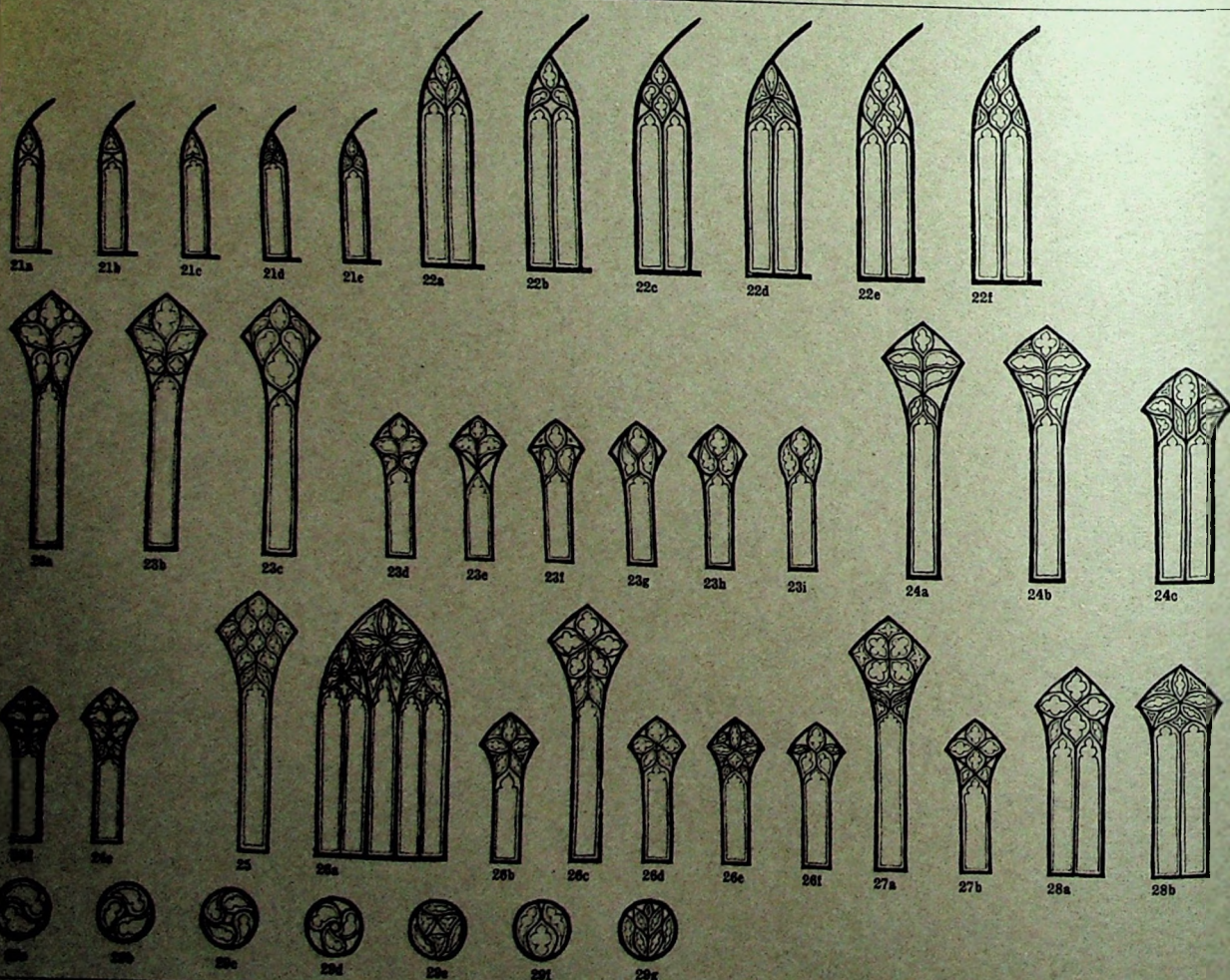
24

- a OLD BOLINGBROKE after 1360
- b GRANTHAM
- c DOUGHTON-LE-SPRING (CD)
- d HASLINGFIELD (C)
- e AUNSEY
- f PATRINGTON (Y)
- g ELY CATHEDRAL (C) Choir
- h WATLINGTON (N)
- i CASTLE ABBY (NB)

These are simply pairs of divergent mouchettes placed one on top of the other and originating from a central stem. This motif can be found as an infilling of all types of Flowing tracery. The w window of York Minster and the 'Bishop's Eye' in the s transept of Lincoln Cathedral are the best examples (see postscript, page 180.)

One of the few examples of a B window with four lights and a complex pattern of mouchettes.

Interlocking mouchettes.





## B2 continued

- 25 HULL (Y)  
Trinity Church
- 26 a LICHFIELD (ST)  
c 1350  
ALGAR KIRK  
b RIPPINGALE  
c GRANTHAM  
d, e FRISBY-ON-WREAK  
(LR)  
f HALLATON (LR)
- 27 a SOHAM (C)  
b HARROWBY
- 28 a SHERE (SY)  
b FORDHAM (C)
- 29 a ANCASTER  
b UFFINGTON  
c EXETER (DN)  
d RATBY (LR)  
e EXETER (DN)  
f LINLITHGOW (WL)  
g SNETTISHAM (N)

Reticulated centre but with divergent mouchettes in side arches. Fishlake (Y) five-lights, has reticulation in all three divisions. (Sharpe's key drawing for B.)

Five petal flower groups. Very common, but this is a rare example of the same motif appearing in all three compartments. A very consistent window. Flattened daggers are curious.

Variety of fat and thin daggers and other curious details.

Four-petal flower. Curious effect of vertical and horizontal axes.

Same framework as 23e. Diagonal axes.

Rare four-light B windows, lumpish centre compartment.

Strictly the centre belongs to Geometrical tracery, but the mouchette wheels, *roue tournante* and other combinations of flowing motifs within the circle are included here. This is the only device in English tracery that upsets the symmetry of windows. French Flamboyant tracery of the following century is, by contrast, often very lop-sided.

Arrangements of flowing motifs in circles.

Side-by-side duplication of B1, six lights.

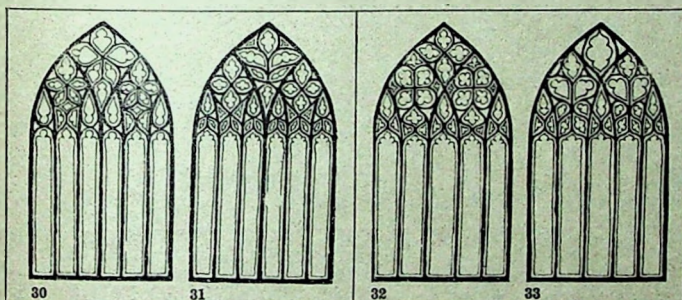
## B3



- 30 ALGAR KIRK  
N transept
- 31 ALGAR KIRK  
E window

Five petal star in kite shaped centre. Central compartment of side arches cf 26c, sub-side arches 21a.

Divergent centre. Framework of side arch centres 27b sub-side arches 21d.



## B4



- 32 ATTLEBOROUGH (N)
- 33 INGHAM (N)  
Before 1344  
SCOTROW (N)

Overlapping duplication of B1.

This is almost exactly a double version of 27a.

Very interesting change of emphasis given by concave link between divergent and vertical mouchettes. This anticipates a complete breakdown of the B4 framework, cf C2.

## C



Only a generalized definition is possible. There is no primary framework dividing C tracery. Instead, a homogeneous effect is achieved by running the same moulding continuously through mullions and tracery details. The moulding profiles are much simpler than those of type A and earlier windows. The absence of rigid compartment divisions leaves the way open for free and imaginative designs. Yet even here the standard motifs still form the basis. Type C can be sub-divided into at least six groups.

## C1



The development of straightforward Reticulation into more Flamboyant tracery is fascinating. There are examples all over the country marking each step in the development which is in no way confined to Lincolnshire.

## C1 continued

- 34 a ST WALLINGHAM (N)  
b Houghton ST. GILES (N)  
c CALDICOTT (M)  
d FORT AUDEMER (France)  
e WELWICK (Y)
- 35 a-d
- a SNETTISHAM (N)  
GRANTCHESTER (C)  
b FLEDBOROUGH (NM)  
ST CLEMENT (Jersey)  
ASWARTY  
c EDINBURGH  
St Giles Cathedral  
d BOLTON (Y)  
Abbey  
DIGBY  
RILLINGHAY  
S. LOPHAM (N)  
BREDE (SX)  
e CHIPPING NORTON (C)  
f ST. LAWRENCE (Jersey)
- 36 SUTTON-CUM-LOUND (NM)
- 37 ELSING (N)
- 38 HECKINGTON  
OLD BOLLINGBROKE  
CHIPPING WARDEN  
WALCOT (NH)  
SIDTHORPE (NM)
- 39 BOSTON  
E window  
1856

Angular Reticulated pattern sub-divided by mouchettes. 'Frayed-edges' very noticeable.

A unique and uncompromising solution of the edge problem. Window arch follows the line of the outside edges of Reticulation.

Simple Reticulation, but more carefully thought out than a and b.

Reticulation stretched vertically, but with the same sub-divisions as a and b.

Quite a common pattern. The basic construction may be thought of as an enlargement of the sub-divided Reticulated unit of 24a, or as a distortion of the three units pushed outwards to fill the window arch. The varied infilling details are interesting here.

Geometrical circles and the deliberate separation of the three shapes make this a static pattern.

Restless effect gained by the converging mouchettes in opposition to the flow of the main lines.

This sub-division reinforces the basic flow.

Consistent twisted Reticulation.

The three shapes fused into a Flamboyant pattern with no sub-divisions.

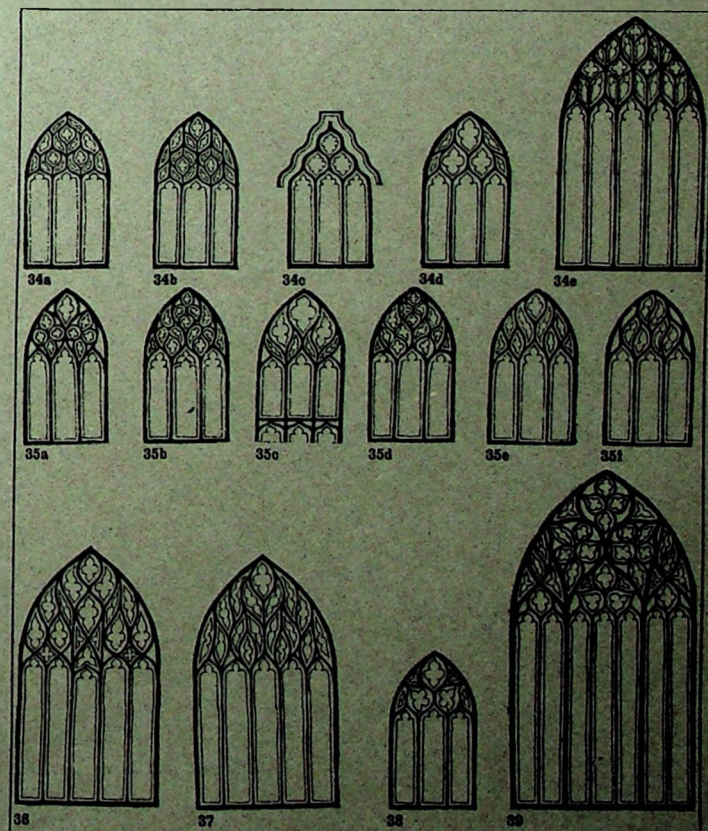
Halfway to France—asymmetrical Flamboyant tracery.

There is a hint of B2 framework and the 23e detail in this. All divisions are of about equal weight.

This is a cautiously Flamboyant window with just enough subtlety to distinguish it from French tracery.

Smaller three-light windows very often have this divergent grouping of Reticulation. The pointed tops of the two side figures are twisted outwards to meet the window arch—a sensible way of overcoming the left-over shapes of most straight Reticulation.

A much enlarged version by Gilbert Scott of 38, which is repeated at the same scale over the central group of three lights. Strange globular infilling details. (NH. Records assert that this is a copy of the nine-light Carlisle E window, but in fact these two windows have nothing in common.)





40 a LEA

KIRWORTH  
BRAUCHAMP (LR)  
GADDSEBY (LR)  
MALLATON (LR)

b BURTON-ON-STATHER

OXFORD  
Christ Church

c CORHAM (W)

d N. LEVERTON (WM)

GARMINGTON (O)  
GREEN HORTON (WM)  
TOWCESTER (WM)  
MISTERTON (LR)  
KIRBY KILLARS (LR)

e OUNDLE (WM)

OXFORD  
Christ Church

f CHELTENHAM (O)

LINDFIELD (SK)  
KITCHINGHAM (SK)

g CRICK (WM)

CHADDERLEY  
CORBETT (WM)

h CHELTENHAM (O)

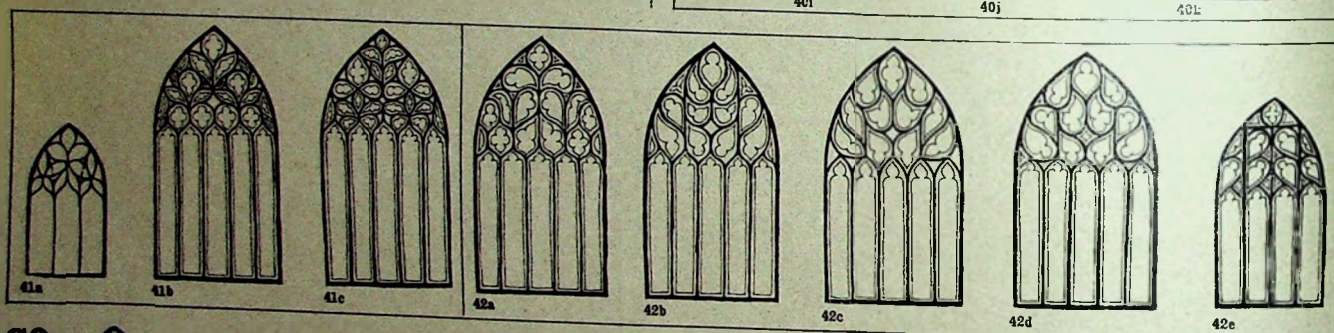
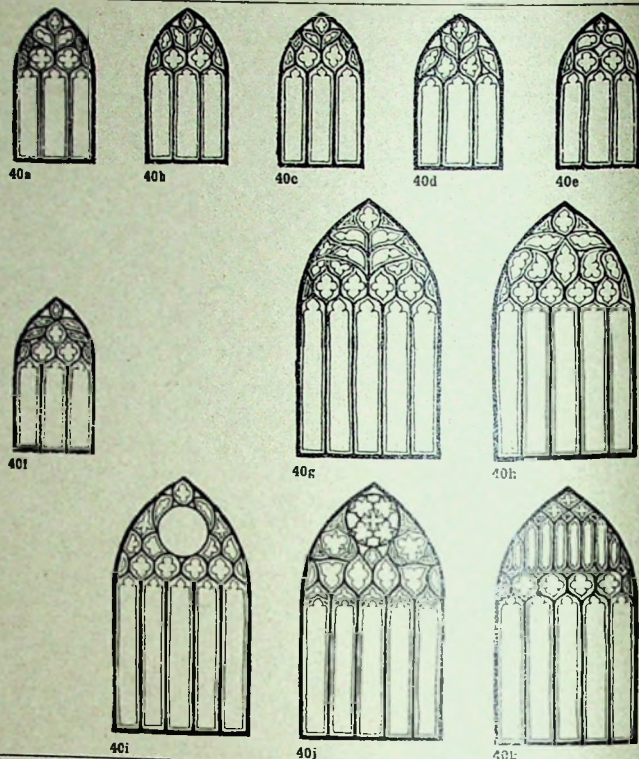
This group represents the wastebin of flowing tracery. There are countless examples of windows which have in common a row of Reticulation immediately above the window lights. What happens above this is a more or less arbitrary arrangement of mouchettes. The divergent scheme is most common—s-d, e.

Less awkward than most of the group, this design is remarkable because it is repeated in two churches in the South-East.

Most of the windows in this church are unusual. (NB Freeman refers to a Rickman drawing showing cusping in the now empty circle.)

Probably an earlier window with the 'Kentish' motif.

A Perpendicular window included to show how easily the detail above the row of Reticulation may be varied.



C2



41 a BURTON-AT-ROSE (X)

b CRICK (WM)

COVENTRY (WM)  
St John's Hospital  
Chapel

c NORWICH (B)  
St John  
Maddermarket

These four windows are sufficiently interesting to justify a separate group. All have an implied 24 framework. Each of the five-light windows has a double set of details and only the bounding-line of the framework is missing. That 41b should have an identical twin at Coventry is also remarkable.

C3



Mouchettes and some unstandardized motifs arranged over five lights so as to leave parallel vertical lines over the second and fourth lights.

42 a DOOTHBY PAGNELL

b BISHOPSTON (Lanc 1771)

c LINCOLN  
St Giles Cathedral

d LINCOLN  
St Benedict

e WATFORD (Y)

There are at least three examples of this in Lincolnshire. Each has a refreshing individuality combined with the common parallel lines. s and d are almost identical, so close in fact, that inaccurate restoration may account for the difference.

C4



43 a ASFORDBY (LR)

b HARKBY (LR)

c ROXBY

d THREEKINGHAM

e SLEAFORD

44 NAVENTRY

Divergent, convergent, reversed and interlocking mouchettes. The motifs so often used to fill the side arches of A and B windows, here occupy the whole window head and take the same moulding as the mullions.

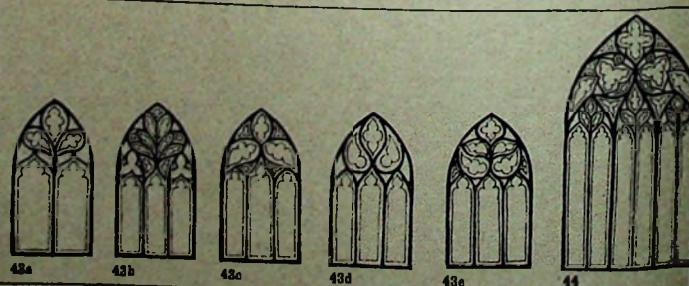
Blunt or pointed divergent mouchettes originate naturally from a central mullion, so most of these are two- or four-light windows. b is a neat exception and, judging by the trefoils over the outer lights, an earlier window.

The three-light convergent arrangement is as common as Reticulation in small aisle windows.

Reversed blunt ended mouchettes fit more comfortably over the three lights.

Interlocking reversed and divergent mouchettes. Identical window as far away as Edinburgh. Five others in Lincolnshire.

Elaborate detail inside enlarged convergent mouchettes.



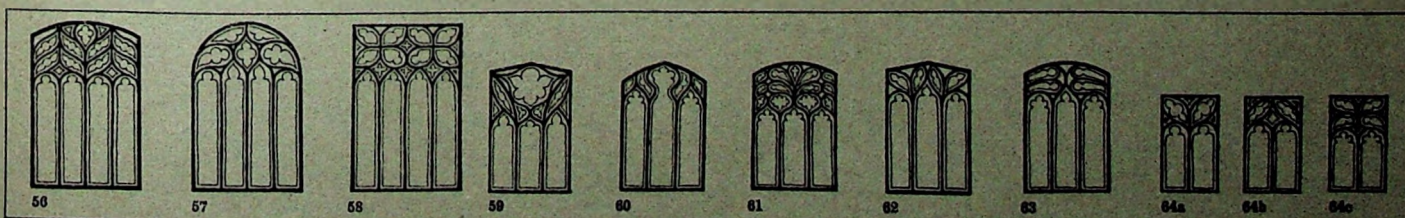
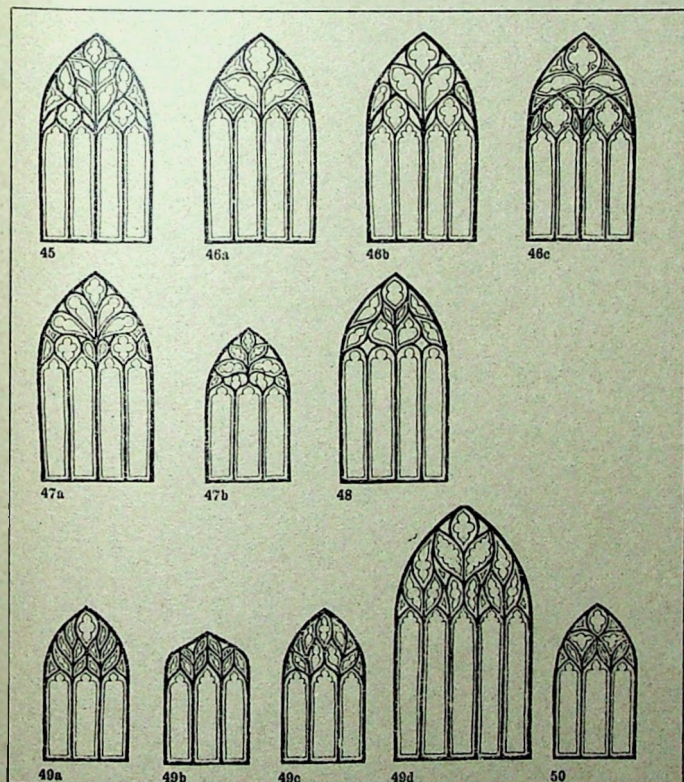


# C5



Stem and leaf. The windows shown are all quite different from each other in character, but each has a stem which is a continuation of the central motif, or, in the case of three light windows, of both mullions.

- 45 SLEAFORD (N) aisle  
WELBOURN  
WILLOWHAY
- 46 a SWINSTEAD  
SLIMBRIDGE (N)  
CAM (U)  
b YORK  
St Saviour  
CRICK (NH)  
c BOSTON  
N aisle  
HALTHAM-ON-BAIN
- 47 a PECKLETON (LR)  
b CLAYBROOK (LR)  
c BILLINGHAM
- 48 a N LEVERTON (NM)  
b DEEPING ST. JAMES  
c GREAT GRIMSHY  
d RINGSTEAD (NH)  
COTTERSTOCK (NH)
- 49 a N LEVERTON (NM)  
b DEEPING ST. JAMES  
c GREAT GRIMSHY  
d RINGSTEAD (NH)  
COTTERSTOCK (NH)
- 50 BOLTON (Y) Abbey
- This has the supporting arches of an A window, but both tracery and mullions are defined by the same moulding. There is an unusual mixture of tension and balance in the design. (All the window tracery in this fine church has a sinewy energetic quality.) The eye is not drawn to any particular motif but led over the pattern by a series of subtle changes of emphasis. The interstices have similar visual weight.
- All three have the simple side arch of A1 windows and mouchettes diverging from a central stem. a is strange, with strongly defined side arches dissociated from the motif above. The design is unexpectedly repeated as the E window of the tiny church at Haltham-on-Bain, 20 miles away.
- This, like C1 windows, starts with a row of Reticulation at the springing. The central unit is cut in two by the stem which supports a plume of blunt mouchettes.
- An uncomfortable arrangement over three lights.
- A central stem, but the detail suggests movement in towards the centre rather than the more obvious divergent scheme.
- There are very few windows which have a double stem and leaf. a is the best with stems bending inwards and gracefully filling the window. It is similar in character to d.
- The B2 framework is not emphasized by a separate moulding in this design which is more co-ordinated than in any of the B windows. It is repeated at Cotterstock.
- An undistinguished mixture of stem and leaf. Intersecting framework and very nearly a five-petal motif.

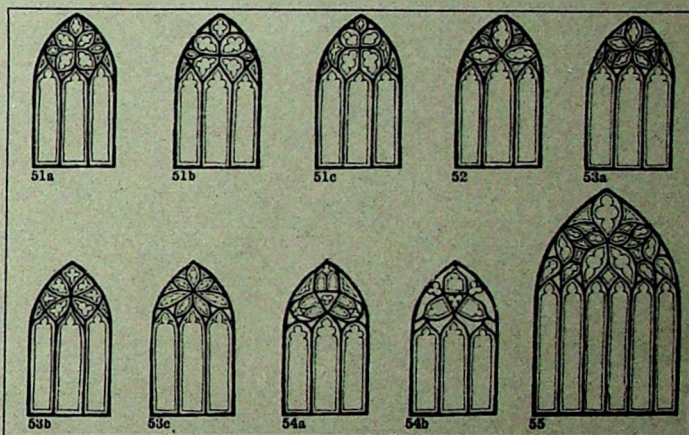


# C6



Three-, four-, five- and seven-petal flowers, or mouchette stars. This motif is very common and often fits clumsily over the window lights.

- 51 a HINGHAM (N)  
WEASENHAM  
ST. PETER (N)  
REYDOUR  
CHURCH BRAMPTON  
(NH)  
b POSTWICK (N)  
c HORTON-ON-  
STATHER  
DARKEY (LR)
- 52 SNETTISHAM (N)
- 53 a HETHERSETT (N)  
ROCHESTER (K)  
Cathedral  
b REYDOUR  
MOLTON KEYNES  
(HU)  
c CHIPPING NORTON  
(O)  
d CLAVERLEY (SR)
- 54 In VICTORIA AND  
ALBERT MUSEUM:  
location unknown
- 55 GRANTHAM  
S aisle E
- Four bulbous petals with vertical-horizontal axes. The angular termination of window lights may be faulty restoration b. c is reminiscent of A1.
- At least seven similar windows. Small details vary. eg. miniature mouchettes often omitted.
- An unusual variant. The figure is constructed by four intersecting arcs. Note how a concave termination of the central light is avoided.
- A strange pair of windows in which three sawn off window lights are arranged around a central triangle.
- This is an original design: the flower grows from the mullions and the side mouchettes pay homage. The unsuitable star shape is given a curious emphasis by sub-dividing two of the petals.



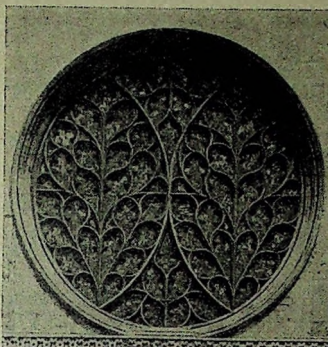
# C7

A selection of flat-headed windows, i.e. where the window arch is sufficiently depressed to affect the design of the tracery. Although these are listed separately, most of them fall more or less into one of the categories already mentioned.

- 56 CAMBRIDGE (O) St Michael
- 57 SOUTHAM (WR)
- 58 HARPSWELL
- 59 WYMLINGTON (RD)
- 60 BYFIELD (NH)
- 61 SPIXWORTH (N)
- 62 KIRWORTH  
BRAUCHAMP (LR)
- 63 FOLKINGHAM
- 64 a b c WYMLINGTON (RD)
- The double stem and leaf C5 upside-down.
- Divergent mouchettes emphasized by segmental head.
- Double four-petal. Square head more suitable than pointed arch.
- B1 framework with curious central motif.
- The central piece of this window is similar to that suggested in the E window of Snettisham (see illustration under special windows).
- Oddly detailed Reticulation and junction of blunt mouchettes.
- Double stem and leaf C5.
- Unusually divided convergent shapes.
- The best window shape for directional mouchettes.



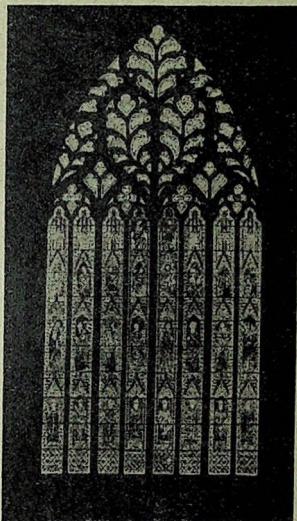
## Postscript: special windows



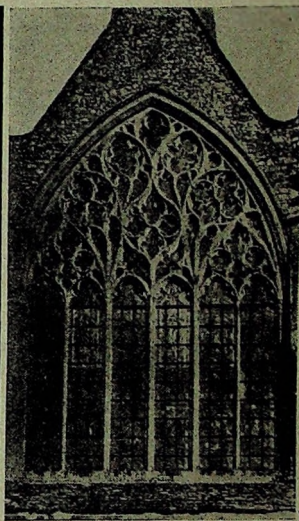
6



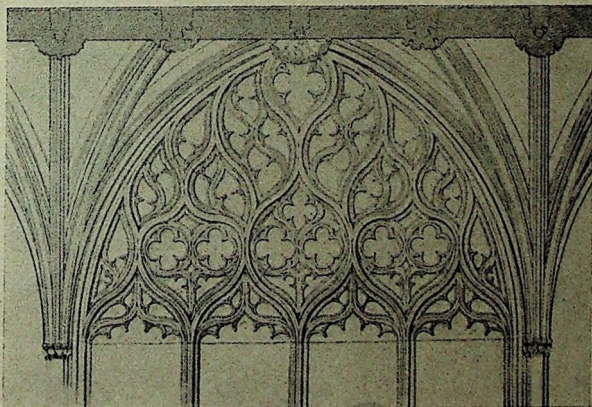
7



8



10



9



11



12

The Bishop's Eye, 6, at Lincoln Cathedral was probably built in memory of Bishop Daldery who died in 1320. Two pointed ellipses are formed by arcs of the same radius as the outline circle. These provide the basic framework. Within each of the ellipses are four diverging bladder shapes originating from a central stem. The tops of the lower four figures make a horizontal break in the composition, and the respective arrangement of mouchettes above and below this line is subtly different. The fragments of medieval glass which were reset in this window in 1750 are too strong and confuse the shape of the tracery.

The west window of Sutterton, 7, disobeys all the rules. Under a segmental head it has an oriental looking centre piece and the beginnings of Reticulation in what might have been a side arch. To this extent the window has some kind of parentage, but the quality of foliation and cusping is consistently original, perverse and restless.

The enormous west window, 8, of York Minster belongs to Type A but stands alone. Its centre piece consists of a heart shape formed by the inner edges of the ogee supporting arches. A continuation of the central mullion splits the heart in two and branches into a large pointed ellipse at the top. All three principal shapes and the spandrels are filled with a stem-and-leaf pattern of blunt ended mouchettes. In spite of this display of originality the use of the standard motifs is unusually consistent.

The reredos of Beverley Minster (Yorks), 9, dates from 1334 and is an inconsistent mixture of fully developed Flamboyant and Geometrical motifs.

The west window of Snettisham (Norfolk) 10, looks Flamboyant at first but is more subtle than that. A group of ingeniously subdivided bladders, arranged round a central reticulation above the two side arches, is the basic scheme. The shapes left by foliation are roughly of equal size and give the window an even, flickering appearance.

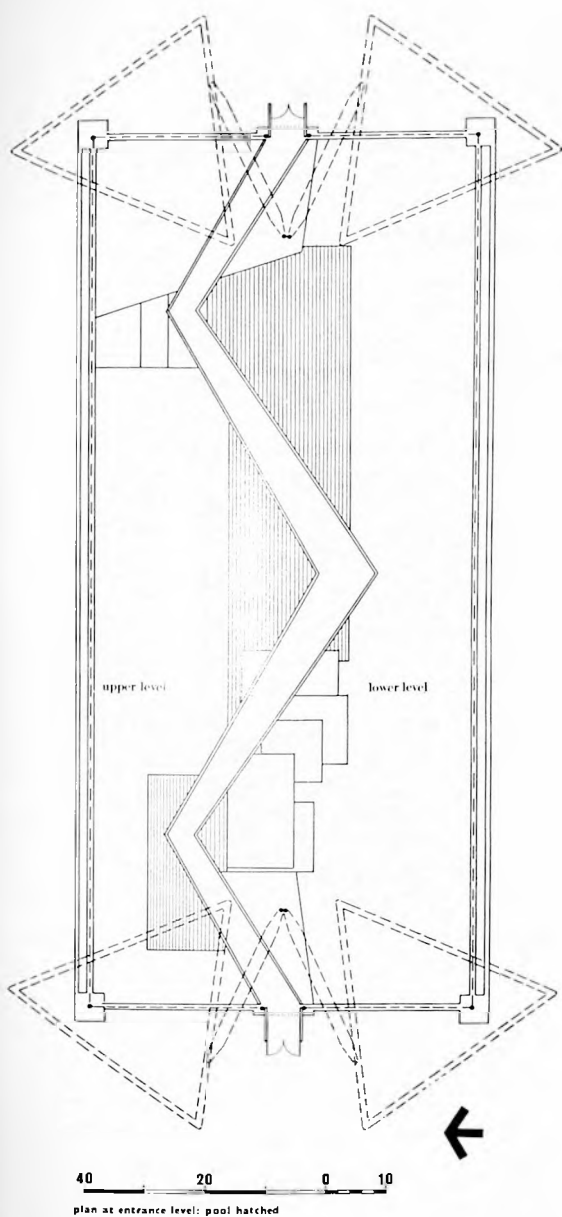
11, in the chancel of Nantwich (Cheshire) there are four Type A1 windows with reversed and interlocking centres, and an unclassifiable five-light window in the north transept. All these display a noticeably agitated flow of motifs, particularly the transept window with its mouchettes flying in all directions against the bizarre framework division.

12, south window of south chapel, Grantham. There is good Flowing tracery in all the south chapel windows. The stellated window has already been mentioned, 55. This five light window is harder to classify. The ogee side arches leave an unusual central shape, cf 53a, which is subdivided by enlarged interlocking mouchettes.





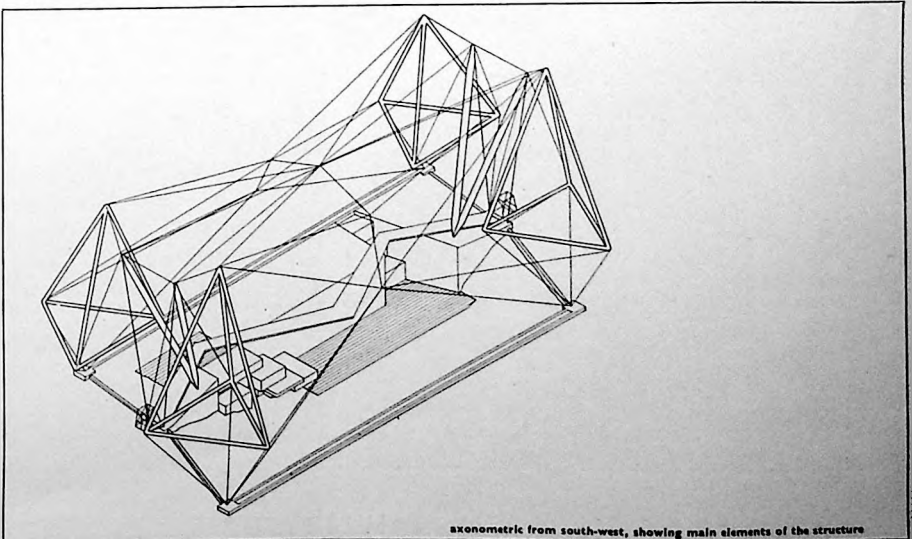
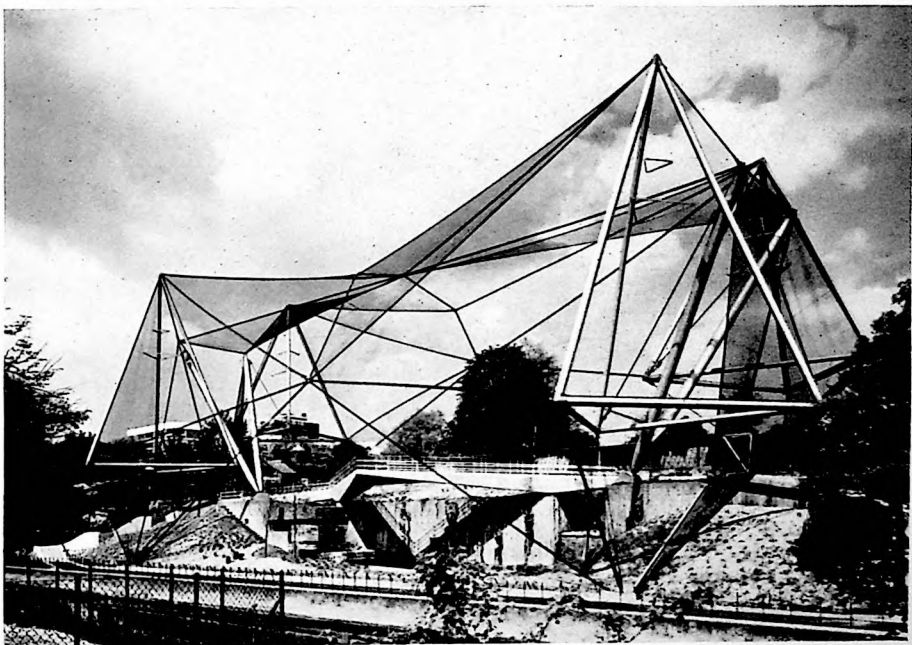
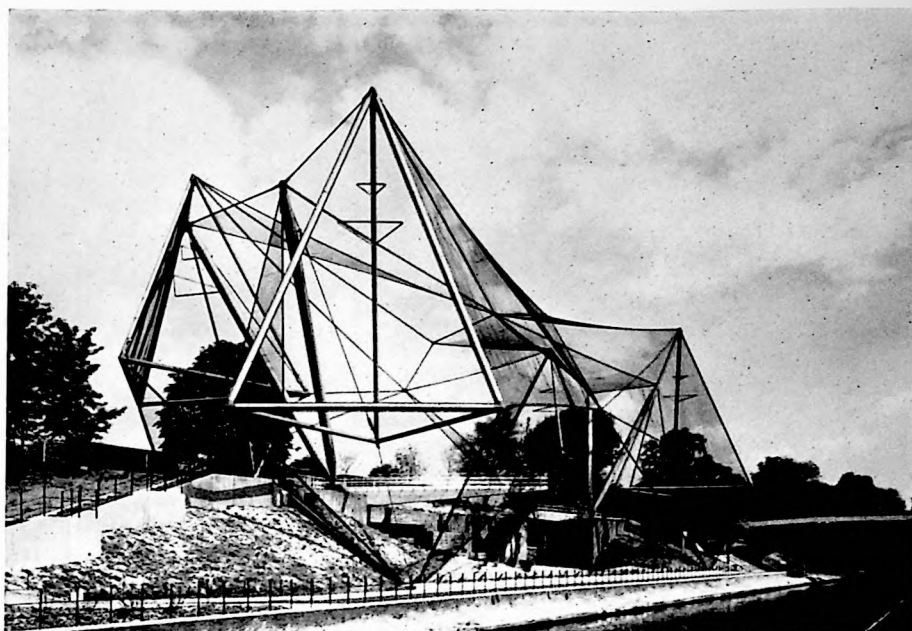




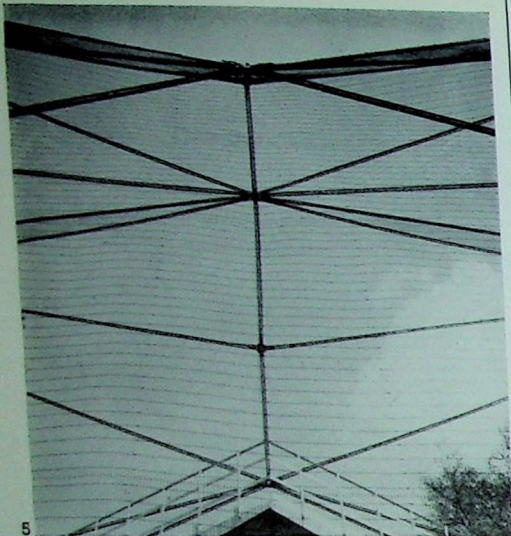
## AVIARY, LONDON ZOOLOGICAL GARDENS

1 (page 181), the west end of the aviary from the lower level.  
2, inside the aviary, looking from the lower level towards the cascade.

3, general view from the south side of Regent's Park canal, looking eastwards.  
4, general view from the canal looking westwards.







5

## AVIARY, LONDON ZOOLOGICAL GARDENS

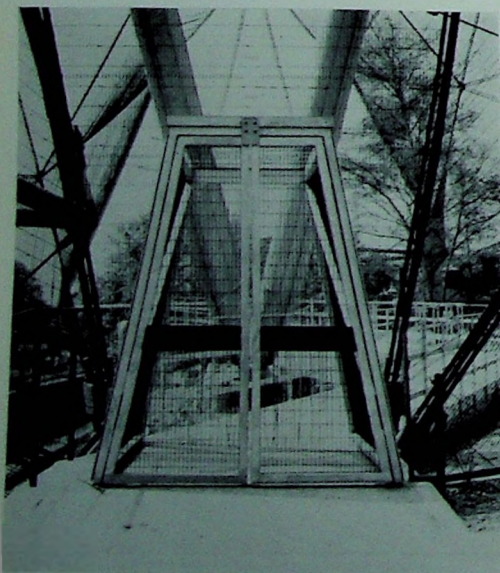
5, the walkway centred on the short axis of the structure, seen from outside the lower level. 6, full-length interior view from the walkway, looking east between the shear legs. 7, eastern gateway, opening in, with the aluminium bead curtains beyond. 8, looking west inside the aviary, from the lower level towards the waterfalls.



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The commission was for a free-flight aviary (to be known as the North Aviary) for a wide range of Indian and African birds, providing public walk-through access as well as the normal peripheral viewing. The site is in the northern part of the Gardens, between the Regent's Canal and Prince Albert Road, and slopes steeply. There is a difference of 22 ft. in height between the high and low levels. This site has never previously been fully used because of the difficulty of building on steeply sloping ground.

The birds were grouped into the following four categories: water birds; ground-dwelling birds; cliff-nesting birds; birds of the trees and bushes.

Some of the birds have never yet reared young in captivity, and it is hoped the new aviary will enable this to take place. It was considered essential that the facilities required by these four groups of birds should not be impeded by the access of the public; on the other hand, the only value of introducing the public is to offer them viewing positions relative to the birds that would otherwise be unobtainable. In fact, the aviary serves a dual purpose: first as an ornithological research unit, and secondly as a place of public interest and enjoyment.

The design provides a large free-flight area for the birds and caters for their varied activities. While it was considered essential to avoid any flight obstruction in the central volume, it was also necessary to provide considerable horizontal perching areas adjacent to each end in addition to the low-level intermediate perching provided by the trees. It was also the intention that the form of the aviary should be recognizable when seen from both inside and outside the zoo from a distance at which the birds themselves are not visible.

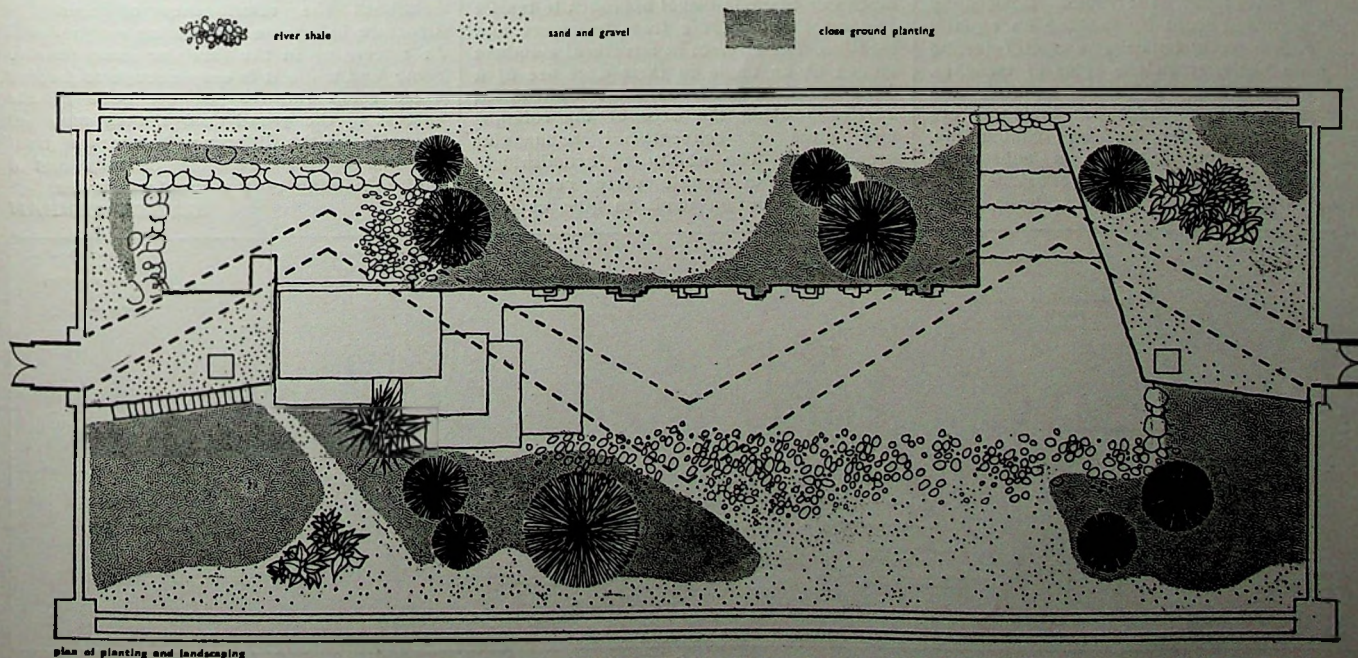
The aviary is rectangular on plan at ground level and measures 150 ft. by 63 ft. with the long sides parallel to the canal. Above ground level the structure projects outside the rectangle a maximum of 20 ft. at the ends and 13 ft. at the sides. The aviary rises to 80 ft. above the lower path adjacent to the canal

and 58 ft. above the upper path. The paths run directly against the sides of the aviary, providing an extensive area of public viewing from outside. Flights of steps link the upper and lower paths and lead to the entrance gates.

The aviary is clad with black anodized welded aluminium mesh, which was fabricated in 12 ft. by 4 ft. panels and connected together with crimped aluminium connectors. The mesh is rectangular, with vertical wires at 1½ in. centres and horizontal wires at 6 in. centres. The mesh is supported on tension cables which are anchored to the aluminium triangular end-frames, which in turn are tied to the top of the end shear-legs and to the ground. Each end framework is prestressed by pretensioning the cable between the tops of the shear legs. The cables are 1 in. to 2½ in. in diameter and are of high tensile steel wires sheathed in black plastic. Anchorage connections are in stainless steel.

The aluminium frames are 43 ft. and 55 ft. in height and are constructed from 12 in. diameter tubes of various wall thickness and corner castings. The shear legs are 54 ft. long and 24 in. in diameter and are made up by welding together curved aluminium extrusions. The elevated public walkway which cantilevers 40 ft. from the cliff face is of prestressed concrete, while the retaining walls and foundations are of reinforced concrete.

The planting scheme provides a landscape of plants forming mats and curtains of greenery against the cliff, with some open areas of gravel and pebbles. The planting extends beyond the aviary at both ends. All the inside plants have been chosen to withstand trampling and nibbling by the birds; they are tough, vigorous creeping and climbing plants, mostly evergreen, which will blend into one another, edging the areas of bare gravel. Trees, some of fairly large size, have been planted inside and will, together with the landscaping, take several years to mature. Consulting engineers, Felix J. Samuely and Partners. Quantity surveyors, Douglas Smith and Ruddell.



plan of planting and landscaping



Collapsed goal-posts among the trees—this, undoubtedly, is the first impression of the North Aviary from Primrose Hill, and equally undoubtedly it is a very belated contribution to the Arcadian tradition in British architecture. But, within that tradition, it does not belong to the gimcrack wing that gave us so many fake ruins and other collapsed objects among trees; rather, it belongs to the tough-minded stream whose triumphs are the palm stove at Kew Gardens, or Paxton's Victoria Regia house at Chatsworth.

In common with these great temples of acquisitive botany, the aviary is a walk-through exhibition-environment. This is not a total innovation at Regent's Park Zoo, because one is also permitted to share the same physical space as the humming-birds, for instance. But to build on this scale and in the open is a very different problem from the creation of the small, totally artificial, environment in which the humming-birds enjoy a manufactured climate secured by double-doored light-trap entrances. In the North Aviary the problem was more that of taming a piece of the existing topography and covering it with an enclosure high enough and broad enough for large birds to fly convincingly—and yet keep the public close enough to avoid the 'Whipsnade effect' of sheer distance and natural surroundings making the exhibits invisible. With very little ingenuity, the form and levels of the present site would probably have made for better-than-average visibility even with an enclosure that permitted observation only from the outside. The creation of an internal observation route, by means as complex as a dog-leg bridge without intermediate supports, therefore proposes a significant improvement over outside viewing—and if the design failed to deliver this, then it would fail as architecture however handsome the covering structure. But, quite obviously (though not so obviously that one does not have to explain it, alas) the bridge offers a bird's-eye-type view of the cliff-face that no rearrangement of the solid topography could afford, except by making an equally high cliff directly opposite, and cliff-nesting birds do not nest on the sides of trenches. The other views, of birds washing and wading in the cascades for instance, are supernumerary benefits by comparison, though their sum-total is a substantial additional justification for the bridge. Some architectural idealists have com-

plained that the bridge is too thick, especially at its springings from the cliff, and have cited the thin-slab effect of the famous spiral ramps of the penguin pool in justification. In rebuttal (because this is a very trivial objection) one must point out that both the span and the loading here are of a totally different order, and that the aesthetic neatness of Lubetkin's ramps had to be bought at the cost of making their springings almost solid reinforcing-rod with barely enough concrete to cover. In any case, the user of the bridge does not see its supporting musculature, only a flat ribbon of footpath zig-zagging off into space and protected by hand-rails and balustrades of no more than domestic strength. It all looks more perilous than it really is, and has the psychological effect of putting the visitor on what might be called an even footing with the birds—up in the air, out of contact with the earth's surface.

Now, from the point of view of critical evaluation, the most striking aspect of the aviary is that these manipulations of the landscape are not only more crucial to the proper functioning of the building than is the visible building above ground, but at the same time they have only the most marginal effect in determining the form of the 'building,' i.e., the covering cage. This is not to say that there were no determining factors at all: the size of the mesh of the netting was effectively settled by the requirement of keeping the right birds in and the wrong birds out with the minimum weight of metal. There were undoubtedly site-factors that constrained the design, notably the problem of footings and where to put them. Yet, given all this, a great variety of other possible structures could have sheltered this rockwork and this bridge; nothing inherent in the programme called for the devising of an experimental tensistruttura—though it is possible that the awkwardness of the site might have constrained a more conventional design to employ some unpleasantly massive structural members.

Even the present structure is too massive to please the eyes of some people, apparently—which shows, chiefly, how much our common visual approach to tensile structures still suffers from ignorance and idealism. The stresses in structural members loaded at an angle to their axes are of a quite different order to those transmitted vertically along the axes of the columns and piers of conventional rectangular architecture. The ability of astonishingly thin cables in tension tends to give us false

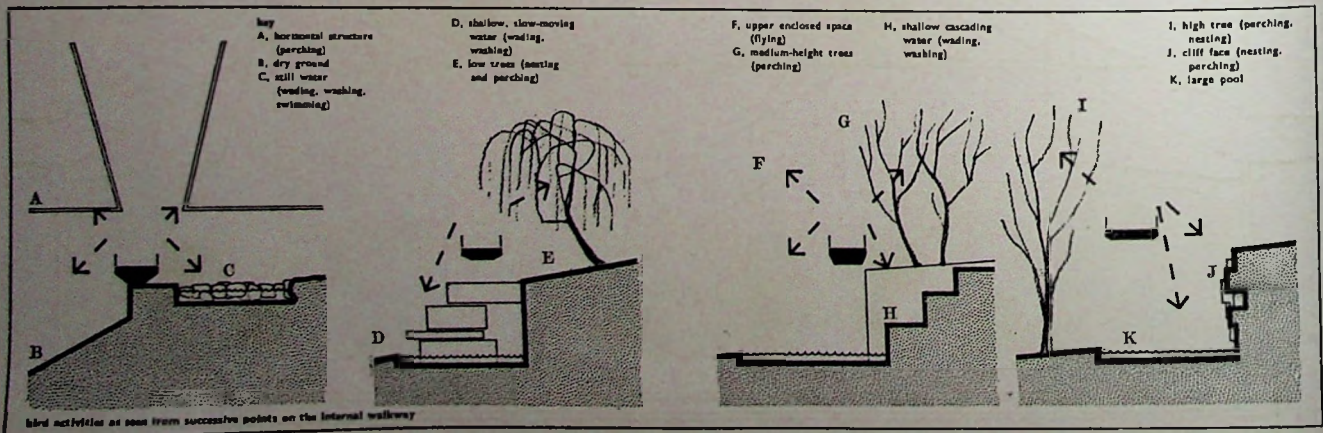
hopes of the possible slenderness-ratio of the compressive members that have to absorb, at sundry cock-eyed angles, the accumulated consequences of the cables' tensile magic. Not only this, but stiffness too is a problem in long unbraced struts. In the only previous British structure even remotely comparable to the aviary—Powell and Moya's South Bank Skylon of 1951—the difference between the architects' original idealised concept of feathery lattices in compression, and the brute struts that finally got built, almost unhinged the design visually.

The aviary is one of the few large tensile structures to date in which the original design has not been coarsened in this way. Greater structural sophistication, greater structural realism, and the integration of a crack-hot engineer into the design team from a very early stage, produced a design in which the proportions of the parts are hardly altered from the original model-studies—the diameter of the sheer legs has been slightly increased for the sake of stiffness; that is all.

But, if complaints of overweight structure can be dismissed as idealistic nonsense, some of the objections to under-done detailing are less easily disposed of. While the management of the ends, joints and connections of the main metallic structure seems admirable and convincing, the tailoring of the joints and attachments of the fine-structure of the mesh seems less than housewifely, even when various technical difficulties have been allowed for (it is worth remembering that these problems were not referred to in the early model studies and have, one suspects, been solved ad hoc). Again, the failure to introduce optical corrections to the heights of the balustrades produces some careless-looking corner situations where the bridge changes direction—one balustrade up, the other down. And much of the landscaping—notoriously the sculptures for nesting-boxes—lacks the authority of the structure of the bridge and cage.

No doubt this can be altered, and will have to be when more is known about the nesting preferences of the birds; but the failure to detail-out the relationship of mesh to structure in a more convincing manner will be staring us in the face for some time to come, and while it is easy enough to forgive these small failures for the sake of the success of the grand design, they may yet prove to be the difference between a great building of the twentieth century and a major building of the nineteen-sixties.

REYNER BANHAM









# AVIARY, LONDON ZOOLOGICAL GARDENS



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10. high-level perches which are suspended at the top of each tetrahedron.

11. walkway and waterfalls.



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Roumania is a country undergoing radical and energetic modernization at the same time as it is trying to reassert its individuality and to disentangle its economy from that of the East European bloc, hitherto dominated by Russian requirements and decisions. The architectural scene in Roumania reflects these developments, and architecture there is at present chiefly interesting, not for the buildings going up (though there are several with a fair degree of quality and sophistication) so much as for the methods being used to elevate architecture, in the shortest time possible, into a country-wide service by establishing a set of standards and a system of type-designs which can be made widely applicable but are at the same time adaptable to local requirements.

The urgent need in Roumania is to decentralize; before the war and the subsequent political revolution there were almost no architects—and indeed no architectural activity in the modern sense—outside Bucharest. And Bucharest itself, as European capitals go, was a somewhat provincial place. The industrialization now going forward is being planned in a way that will rapidly modernize the more backward regions and lift them in one operation into the twentieth century from the middle ages which life in the remoter areas—especially rural life—still surprisingly resembles. For this reason industry, instead of being made to expand only where it already exists, is being established in new centres, including some remote mountain areas: thus spreading advanced technical practices throughout the country, improving communications and providing alternative employment to forestry and farmwork. Now no more than 20 per cent of the country's industry is in the Bucharest area.

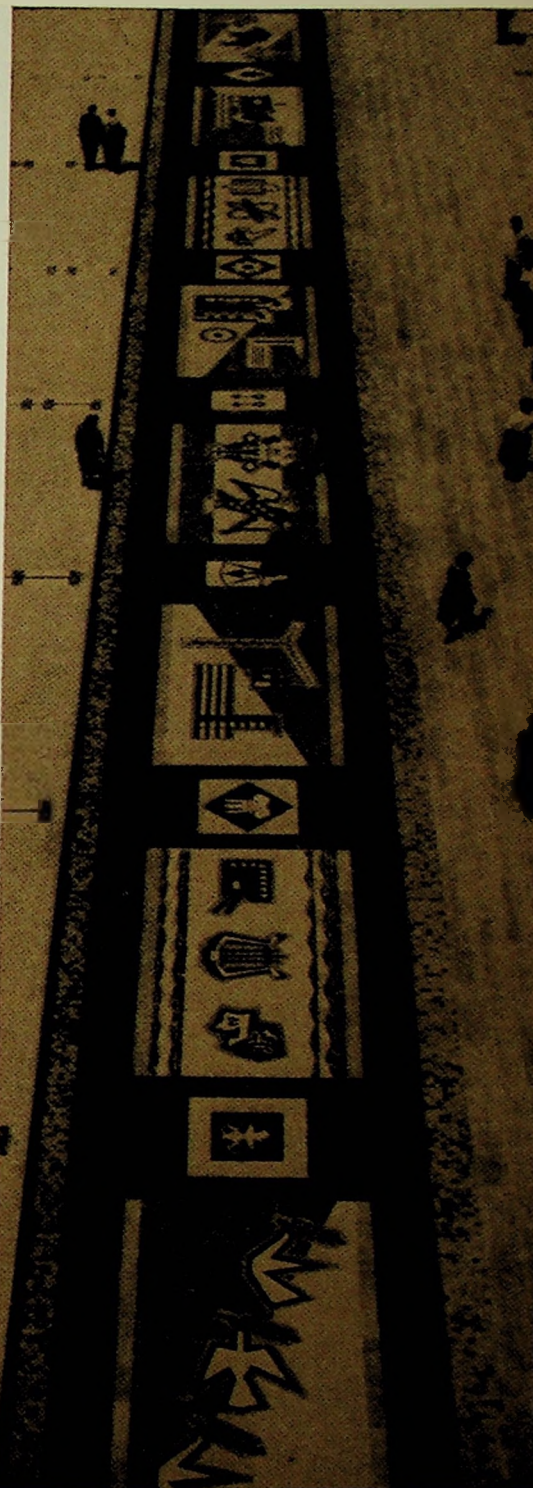
The newly industrialized areas require, of course, large-scale building programmes involving houses, schools, shopping centres, health-clinics—nearly all buildings that lend themselves to standardization; and to overcome the shortage of architects, avoid duplication of effort and expedite development generally these follow type designs produced in one central office. This has the, perhaps even more important, advantage that technically advanced and aesthetically sophisticated standards can be set from the beginning in localities

where it might take a whole generation to reach such standards with local resources gradually building on their own experience.

The central office in Bucharest, where the designs are worked out, is part of the State Committee for Architecture, Construction and Systematization, a body responsible on a national scale for co-ordinating designs and establishing standards and undertaking all research and development work. It does no building itself; neither does the Ministry of Construction, which is responsible—also on the national scale—for planning building programmes, allocating funds and settling priorities. The architectural work in connection with individual projects is in the hands of the architectural offices that have been set up in each region (there are no private architectural offices) and are known as Project Institutes.

These regional offices, sixteen in number, undertake local planning and organize the construction of new buildings required in this region on the basis of the type designs supplied by the Committee for Architecture, Construction and Systematization, but with licence to vary them in detail when the local programme or the nature of a particular site demands it, as long as they keep to the space and accommodation standards laid down. These type designs cover every kind of building and are supplied with complete sets of working drawings and specifications. Only occasionally do 'one-off' buildings require to be designed locally from the beginning when the type-designs do not cater for the need they are to serve.

The standard set by these type-designs is high, though it is surprising that more use is not being made of prefabrication and industrialized building, the conception of which so naturally follows the conception of standardizing designs, already so expertly realized. Only in large blocks of flats are prefabrication techniques (in the form of heavy precast wall-panels) widely used, but far more intensive industrialization will no doubt come about when the building industry has been made capable of producing prefabricated components on a sufficient scale and when distribution from the factories to the sites can be economically planned. Already the use of large-scale prefabricated panels is steadily



1, the work of Roumanian artists used in municipal rebuilding: a pavement in the new town square at Jassy.

J.M. Richards

## REPORT FROM ROUMANIA





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increasing (from, for example, 5 per cent of all buildings in 1960 to 15.8 per cent in 1963), although in the long run the lighter systems, more like the British CLASP, are likely to prove better suited to Roumania because of the prevalence of earthquakes. The use of type designs inevitably results in a certain degree of monotony; when you have seen one block of flats—and indeed one housing scheme—you have seen them all, but it is achieving its object of spreading sophisticated standards quickly throughout the country. A greater danger than monotony is that of too strict and unimaginative bureaucratic control. A centrally organized design system is easiest to operate if everyone toes the line, but it can result in all initiative being taken away from those who are in a position to give the work life and vitality—namely, the architects—and in the untrained eye, or the aesthetic prejudices, of the politicians and administrators being allowed to curtail the architects' creative activities. Now that the system, designed to accelerate progress, is in operation, its present rigidity could well be somewhat relaxed in order to allow the architectural profession to develop more scope and initiative on the lines that it is qualified to do.

This will be easier to achieve when there are more architects, who are at present scarce. In the whole of Roumania there are only about 1,800 to serve a population of 19 million, and there is only one architectural school. This school, in Bucharest—an independent school, situated alongside the university but not part of it—is training new architects at the rate of 200 a year, and to a good standard; the students' work, and the teaching and scope of the curriculum, compare well with those in all but the two or three best British schools. The work is being done under difficult conditions—for example the school building was designed to hold only 200 students altogether instead of 1,200 (200 in each year of the six-year course) and has only been able to expand by building tiers of extra studios inside its courtyard and lacks library and lecture-room places. Regional schools of architecture will no doubt come—in fact some are already being talked of—but there are severe staffing difficulties, chiefly due to the long tradition of all professional activities being centred in Bucharest, and the authorities

2, 2, the Athenaeum (the central concert-hall) at Bucharest, built in 1885, which has just been impeccably restored inside, illustrating the high standard of conservation found throughout Roumania.

## REPORT FROM ROUMANIA





4, one of the main squares of Bucharest, the Piata Republicii, showing the quantity of brand-new buildings in the centre of the city: on the right, 10-storey flats with shops on the ground floor; on the left, the congress hall of the Republic designed in more formalistic style in 1961 by Horia Maicu, who was also the architect of the Russian-styled Scinteia building (see page 195). The congress hall seats 3,000 and is built on to the old Royal Palace which now houses Government

offices and the National Gallery of Art. 5, looking the opposite way from 4, showing central redevelopment in the form of flats and shops, mostly 10-storey but with one 17-storey tower.

6, one of the new housing schemes in the Balta Alba district on the northern edge of Bucharest, sited by a string of lakes. In the background can be seen the Dinamo stadium.

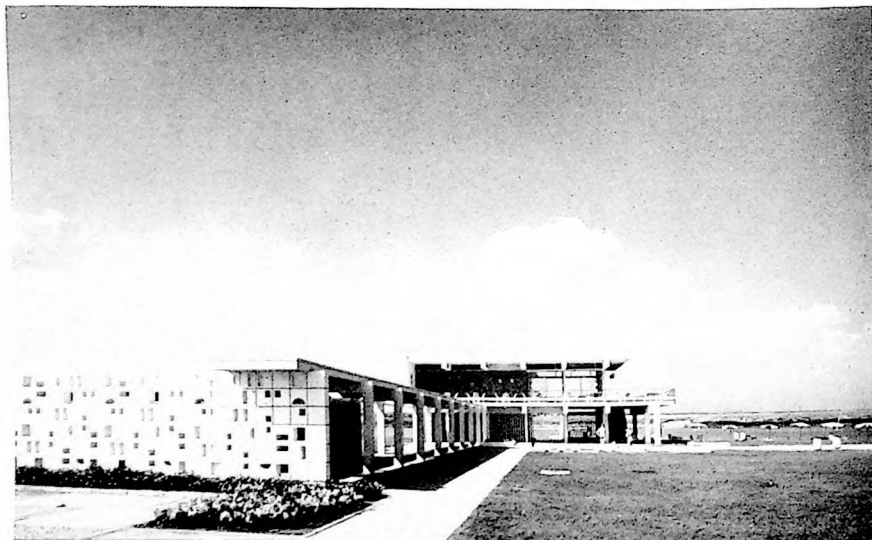
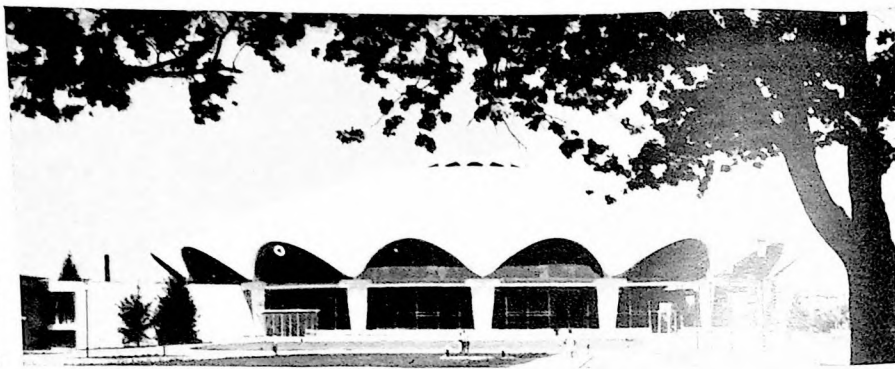
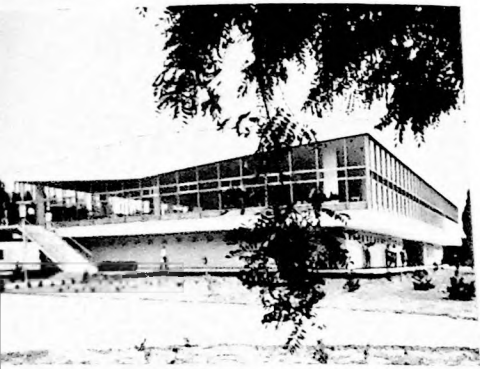
7, the same Balta Alba housing scheme seen from

across one of the lakes.

8, a group of students' hostels, providing a university residential area for Bucharest.

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# REPORT FROM ROUMANIA

9, the main refectory building in the university area of Bucharest.

10, typical secondary school in Bucharest.

11, the recently completed State Circus building, which provides the focal point of another new housing area in the north part of Bucharest. The building seats 2,200 and has a shell-concrete roof. The architect was N. Porumbescu.

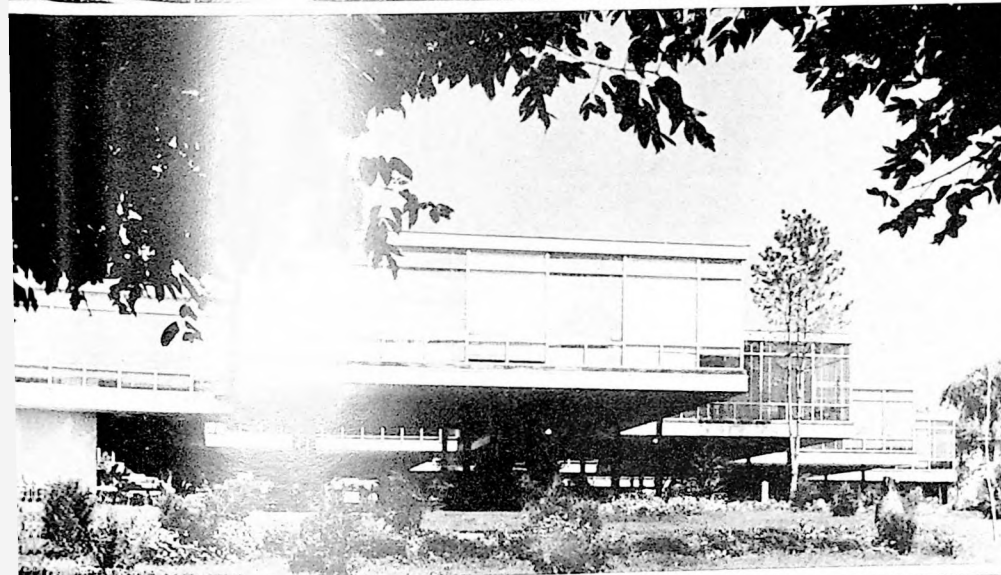
12, curtain-walled block of factory offices in Bucharest, serving the 'Automatica' plant.

13, Mamaia, one of the newly developed summer holiday resorts on the Black Sea coast. It is situated on a narrow strip of land between a fresh-water lagoon, left, and the sea, right.

14, swimming club alongside the beach at Mamaia.

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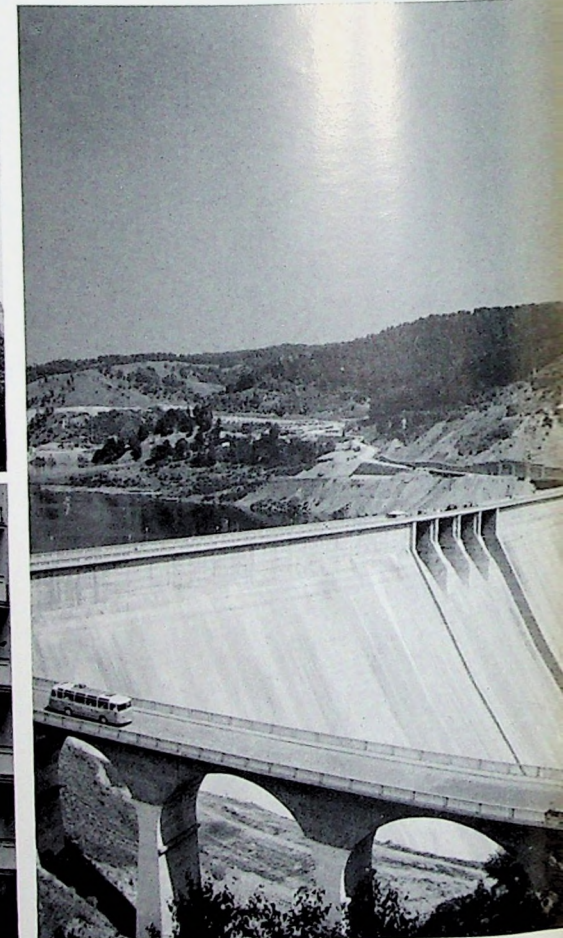
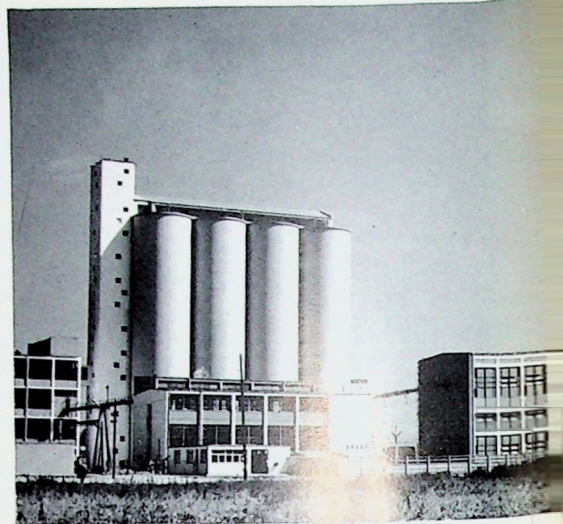


15, sanatorium at Mangalia, another new resort at the extreme southern end of Roumania's Black Sea coast.  
 16, hotels and holiday apartments at Eforie Nord, another resort area south of Constanza.  
 17, 18, restaurants at Eforie, adjoining a group of holiday hotels.  
 19, new flats at Constanza.  
 20, the town square at Baia Mare, in northern Transylvania, near the Russian frontier, showing

the modern character intensive new development has given to the centres of old Roumanian provincial towns.  
 21, another rebuilt and modernized town centre: that of Galatz in eastern Moldavia, where the delta of the Danube begins.  
 22, new housing at Suceava, an old town of northern Moldavia now being rapidly developed industrially. At bottom right is a typical Byzantine-influenced church of the region.

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23. the new town of Onesti (now renamed Gheorghiu-Dej) nearing completion in central Moldavia: a wide shopping boulevard with a parallel row of tall flats rising behind the shops.  
24. close-up of one of the department stores on the point of completion in the same shopping-street at Gheorghiu-Dej, showing also a contrast typical of Roumania—between the sophisticated modern architecture and the primitive type of farm-cart, drawn by a bullock,

still in use in the surrounding villages.  
25. housing at Gheorghiu-Dej with, in the distance, a classical church which is almost all that survives of the village that previously stood here.  
26. Gheorghiu-Dej: the hospital.  
27. housing at Gheorghiu-Dej. The block on the right is of large-panel prefabricated construction  
28. new Roumanian industrial architecture: an oil mill at Jassy, in north-eastern Moldavia.

29. dam forming part of a hydro-electric installation at Bicaz, in central Moldavia.

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are rightly anxious not to set up new schools that cannot maintain the existing standard of training.

Centralization in Bucharest creates other problems too, such as the reluctance of many of the young architects emerging from the school, most of whom are native to Bucharest, to accept jobs in the remoter regional offices, where they will be cut off from their families and from the chief centre of further education and the exchange of ideas. There is no direction of architectural labour, and adequate staffing of the regional project institutes has to be ensured by offering inducements to young architects to work there. These include a lower cost of living and easier housing conditions, but the chief professional inducement is that in the regional institutes the young architect gets more immediate responsibility and quicker promotion to the charge of large building schemes than he would if he remained in Bucharest.

In spite of the monotony of the semi-standardized architecture, and its occasional decline into mediocrity, building all over Roumania has the great merit of being relatively simple and unpretentious. Considering the lack of experienced architects and of a highly skilled building industry, finishes are good and those several years old have deteriorated very little.

The work is uncompromisingly modern. There is very little sign of the historicism, the reminiscent embellishment or the conscious regional stylization that—at least until recently—dominated Russian architecture. Although there is no sign either of that chauvinistic yearning after folk traditions found in other East European countries, some Roumanian architects, no doubt impelled by the reassertion of national identity mentioned at the beginning of this article, have the habit of deploring the international nature of the modern style and the absence of an evident Roumanian character in the work produced. In practice, however, they clearly understand that a fabricated national style is contrary to the ideals of modern architecture and that a recognizably Roumanian architecture can only emerge in its own time by a process of adaptation to the demands of climate, culture and social usage. No admiration, moreover, is expressed for the vast Scinteia building in Bucharest, a

Government publishing, printing and information centre where the Ministry of Culture is also housed, built some years ago and echoing the style of the Stalin-period monumental buildings of Moscow. At present architectural and constructional resources are concentrated on housing more than on any other type of building. There is a serious housing shortage, but impressive efforts are being made to meet it; no less than 7 per cent of the national budget is being spent on housing, which is said to be the highest of any country in Europe. Most of the housing consists of blocks of flats, restricted to a few more or less standardized types. The most usual heights are nine or ten storeys in central Bucharest and on one or two exceptional sites, and four or five storeys elsewhere. The space standards internally are good, considering the shortage, but there is an unexpectedly high proportion of one-room flats.

There is a number of very large new housing schemes on the outskirts of Bucharest, composed of well designed blocks somewhat unimaginatively laid out and landscaped—altogether, the attention given to landscaping and to the treatment of the space between buildings is one of the weakest points of modern Roumanian architecture, a surprising weakness in view of the emphasis on the creation of an improved social environment. About the best of these perimeter housing schemes is that at Balta Alba illustrated here. There is also a surprising amount of new housing in the very centre of the city, several of the principal streets of which have been totally rebuilt since the war, with multi-

storey housing above ground-floor shops. Wide traffic avenues leading out of the city centre are also lined with housing blocks somewhat in Moscow style, though the individual buildings are less clumsy and are more sophisticated in detail. Outside Bucharest many towns are being transformed in scale by the construction of high density housing schemes, often not far from the centre.

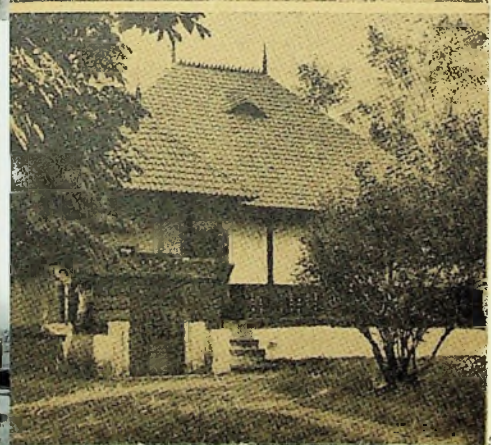
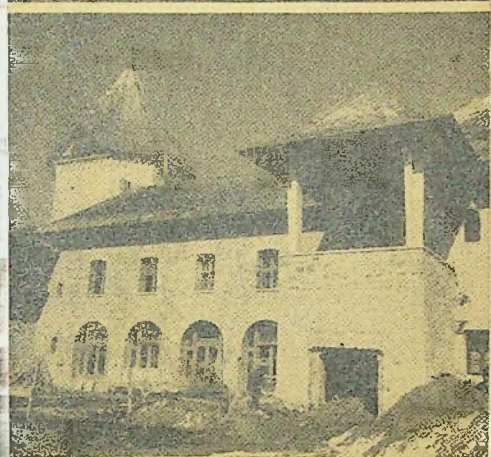
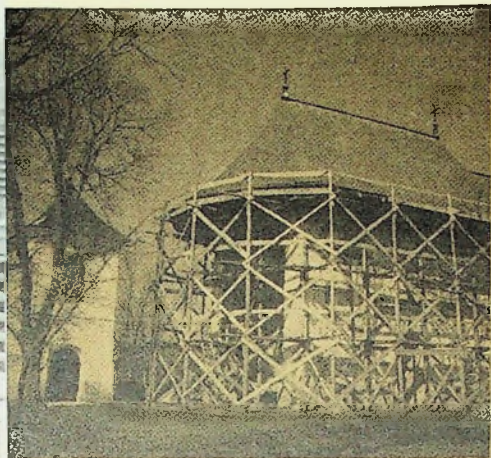
There is one nearly completed new town, begun in 1952 and with a population already of 45,000. It is in the east central part of the country in an area subject to intensive industrialization. Until this year it was called Onesti but has now been renamed Gheorghiu-Dej after the President of Roumania who died in March. It is comparable, in scale and intention, with the English new towns and somewhat resembles those in the Home Counties with the difference that the housing is all flats instead of cottages. Its plan is efficient but elementary, with no attempt made at traffic segregation—which the weight of motor-traffic in Roumania does not, of course, yet require but may do before long. The landscaping is unenterprising and the standard of architecture, once again, estimable but dull; but to have built an up-to-date and modern town in the rapidly changing conditions of post-war Roumania is a real achievement. The town has been designed not in the project institute in the capital of the region (in this case Bacau), as would normally be the case, but in an office in Bucharest set up to co-ordinate the work of the regional offices and to take responsibility for special projects like this. Another new town



30, the Scinteia building in Bucharest, one of the few major buildings to show Russian stylization.

## REPORT FROM ROUMANIA





31, one of the famous painted churches of northern Moldavia—that at Arbore—undergoing restoration of its structure.

32, the monastery buildings at Sucevita, which enclose another of the same group of churches, in course of restoration.

33, in the Village Museum at Bucharest: a nineteenth-century farmhouse from the Ploesti region.

is starting in the coal-mining area in the southern part of the country.

Notwithstanding the concentration of effort on improved housing standards and on widespread industrialization, some of the most interesting architectural developments in Roumania—and certainly the most sophisticated as regards design—are taking place along the Black Sea littoral, where miles of coastline are being transformed into a vast tourist and holiday resort. A surprisingly large proportion of the country's building resources are being invested here, considering that the resort—or chain of resorts—is only open three and a half months in the year.

This enterprise arises both from the desire to build up the foreign tourist trade (and to earn foreign currency by so doing), and from the new social and welfare developments that give workers of all kinds the right to an annual holiday. The holidays are relatively cheap and are provided for in the shape of large hotels and family apartments lining the continuous curve of sandy beach, interspersed with restaurants, cafés and social clubs. Living accommodation is minimal, but wholly adequate for the kind of holiday life that is lived largely out of doors; the restaurants and clubs are excellent and of varying degrees of luxury to cater for varying tastes and purses.

Planning again is unimaginative, though development as a continuous ribbon along the sea front does not offer much scope for interesting relationships between buildings. The individual buildings are for the most part of a very high standard—sometimes spectacularly so—with a refinement of detail and sophistication of style achieved in few other parts of Eastern Europe.

These new resorts are laid out on either side of Constanza, Roumania's one large port on the Black Sea, the newest and the best designed being Mamaia, just north of Constanza, on a long spit of land between a fresh-water lagoon and the sea, just before the marshlands begin that are formed by the Danube delta. The design of the new resorts, though planning and development in a general sense are controlled from Bucharest, is the responsibility of the regional project institute at Constanza, where there is a staff of thirty-five architects.

No account of contemporary architecture in Roumania should conclude without

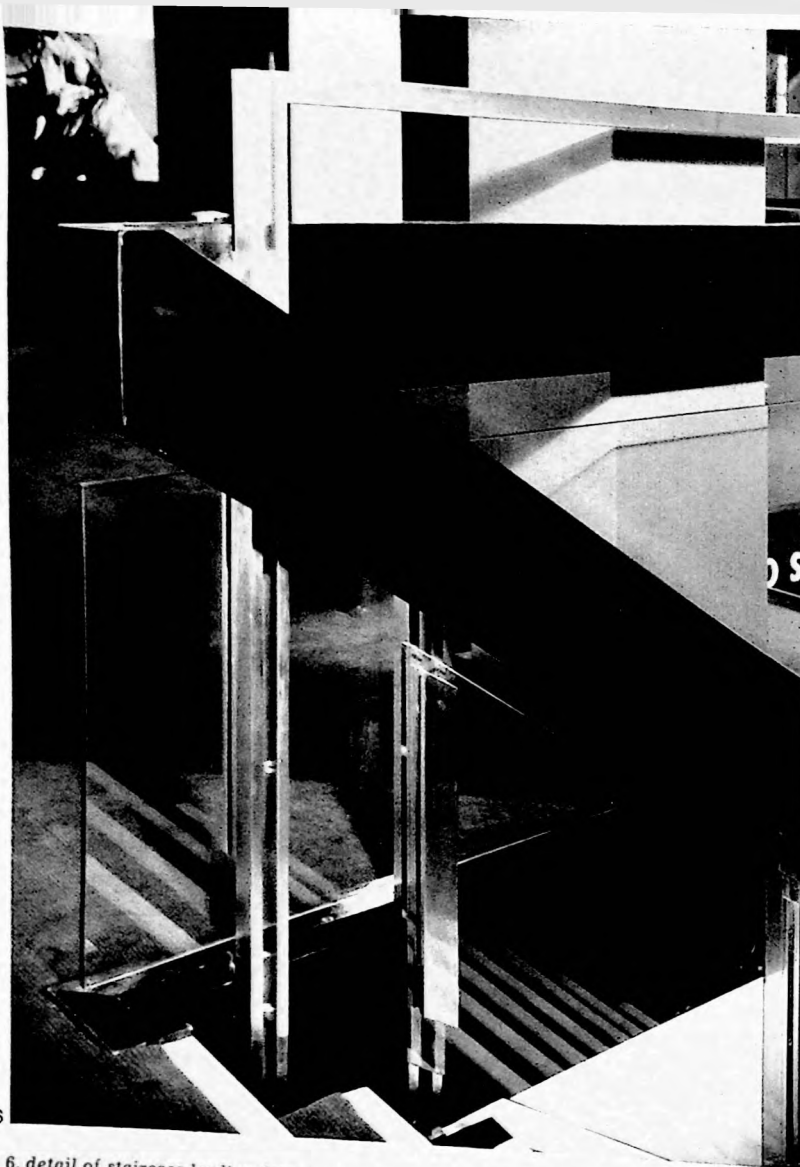
mentioning the attention given to conserving historic buildings. This kind of work seems to reach a high standard in all the East European countries, and in Roumania is impeccable. It is thorough and scholarly but is not overdone; that is, care is taken not to destroy the architectural character or the evidence of history by too complete a restoration. For example in the case of Roumania's greatest architectural treasures, the group of monastic and parish churches in northern Moldavia remarkable for their external wall paintings of the early sixteenth century, dilapidated monastic buildings are being restored and the churches repaired where there are structural defects, but wisely there is no retouching of the paintings even when they have faded on the side of the church exposed to the weather.

Nor are the conservation efforts confined to buildings of great antiquity. The internal restoration of the Athenaeum in Bucharest has just been completed—a splendid example of nineteenth-century baroque and Bucharest's principal concert hall. It stands right in the centre and is one of the few really distinguished buildings in a city that has no length of history and no architectural tradition of its own. It was designed by a French architect in 1885 and the foyers, staircases and so on, as well as the auditorium, have been beautifully restored in spite of the variety of coloured marbles, complication of sculptural ornament and quantity of gold leaf required.

As well as conservation work, the recording of old buildings is a continuous activity; not only of the notable monuments but of the vernacular architecture of the different regions. Roumania is wonderfully rich in local building of this kind, mostly in timber but highly ornamented, each region having its own style and traditions. It is still a living tradition, and the farmhouse and village architecture of the country provides fascinating scope for study before modernization destroys its surviving relationship with the popular way of life. Its richness and variety can be seen in Bucharest in the so-called Village Museum—a collection of village buildings, re-erected with their contents, beautifully arranged along the shore of Lake Herastrau and impeccably looked after. They make an even better display than Stockholm's Skansen, which is saying a great deal.

## REPORT FROM ROUMANIA

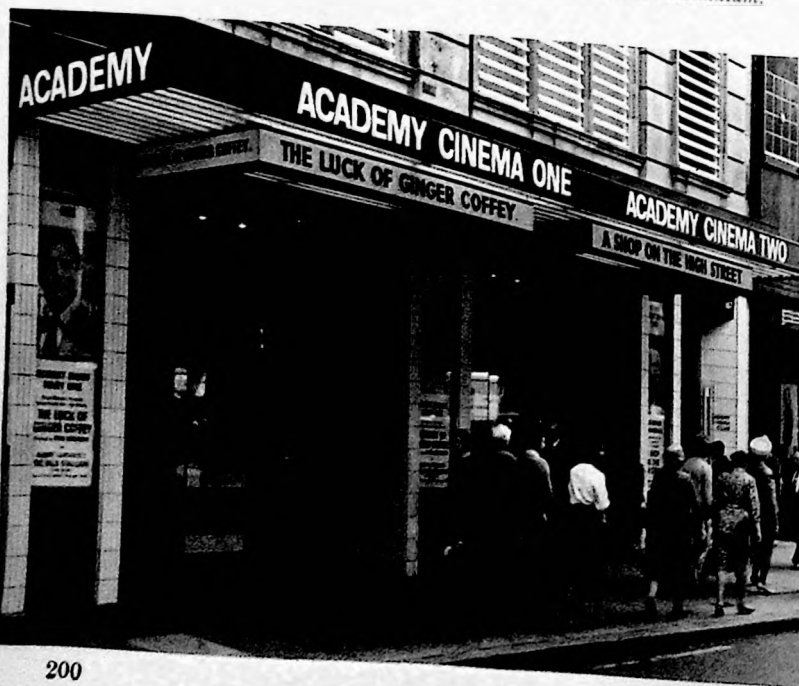




6

6. detail of staircase leading down to lower foyer. The supports are chromium-plated steel and the banister rail ebonized

mahogany. 7. the cinema front. The columns are faced with white ceramic tiles, the canopy with black enamelled aluminium.



7

right angles and allows the use of steel beams of very small structural depth. A third column in front of the projection box was replaced by cantilevered 'fingers,' the load being taken back on to existing foundations. The ceiling itself is formed from plaster on metal lathing and painted dark green.

Green, black and white are the predominant colours throughout the new parts of the cinema, the auditorium wall coverings, seats and carpets all being green. The screen curtains, a Tibor Reich fabric, are orange and brown. Foyer walls are covered with green fabric.

## Cinema, Oxford Street





# THE VICTIMIZED FIGURE

Robert Melville

There was a time before the war when Jean Hélion's paintings were on reasonably good terms with his thoughts, but in recent years they seem only to receive garbled accounts of them. His thoughts still come out quite clearly in his writing. An interesting passage from a recent article was quoted by Stephen Spender in his introduction to the catalogue of the Hélion Retrospective held at the Leicester Galleries a short while ago: 'We would like, of course, to paint complete works in the style of Carpaccio, Masaccio, Velasquez, Géricault. Technically, it is not utterly impossible. Spiritually it is refused us. Something fundamental has gone wrong. Each time a painting moves in this direction we must rub it out, return to plans that are both simpler and more complex; to firmer notions of space, to a tenser and less explicit degree of representation, the only one our senses can bear today.'

Before the war, when he was painting the abstracts which gave him a place in the international abstract movement only a little below that of the great innovators, his list of past masters would have been different—Poussin and Seurat would have been there instead of Velasquez and Géricault—and his own paintings would have made sense in relation to his

conception of what can be done and what can be borne.

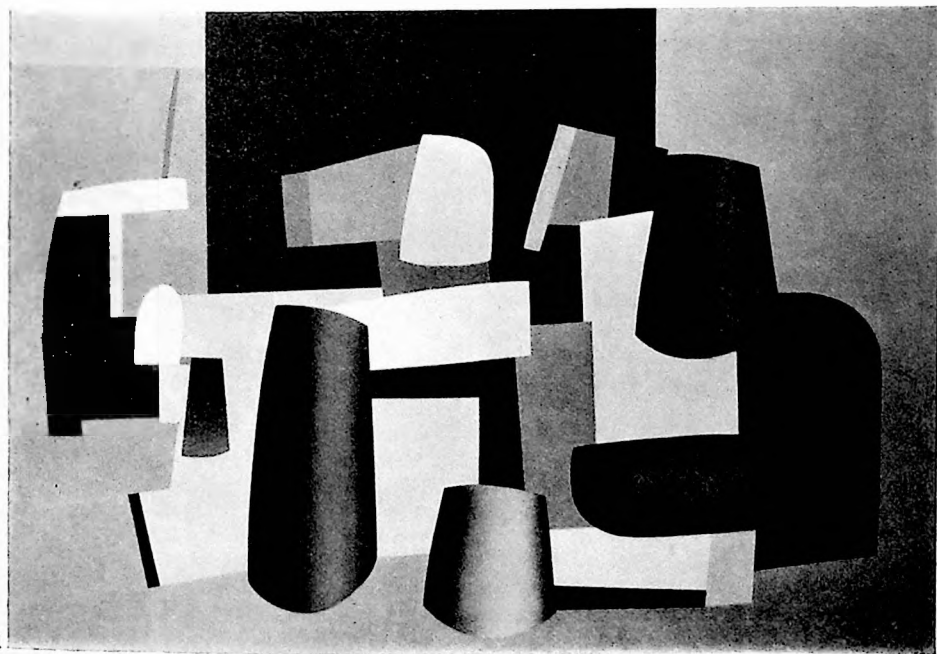
His Retrospective disclosed a development so curious that at first sight it would have seemed more natural in reverse: it was easier to see his recent tonal paintings as his first efforts and the abstracts of the 'thirties as the final outcome. But the abstracts are by no means timeless. They were already just a little out of date in the 'thirties, and would have been far more telling if they had been done in the late 'twenties, for they are a non-figurative development of Léger's *style mécanique* and the Purism of Ozenfant and Jeanneret. They remain so close to still-life arrangements, with their centred look and their overlappings, that the shapes seem remote souvenirs of objects. Yet at the same time they betray a certain 'thirtyishness; there is a hint of Surrealist anachronism in the mixture of flat and modelled forms and the faint suggestion of picturesque space. They are hybrids, but they are crisp and taut and very decorative, 1.

The abstracts were followed by an eccentric series of figurative works, which were intended, I think, as a new humanistic approach, but they plunged him deeper and deeper into images of alienation. The freakish result of treating



folds and creases as separate forms can be seen in *Journalier bleu, 2*, painted in 1947–48. The figure looks like an aggregation of distended rubber goods, and the cracks in the pavement and walls look like bladders which have burst and blown off, as if the rubber monster might have explosively broken wind.

Like, Guttuso, who has given the theme the full realism treatment, Hélion has frequently used men reading newspapers as symbols of *la condition humaine*, and in the very large *Grande journalerie, 3*, painted in 1950, the five men reading newspapers are much more realistically treated than the figure in *Journalier bleu*. It seems to be an attempt at a 'normal' or 'popular' reading of the human figure, but the realism is curiously meagre and undistinguished. There is wit and irony in the display of symbols of communication to create an image of alienation, and the use of the meanest visual clichés for the representation of objects must surely be deliberate, but

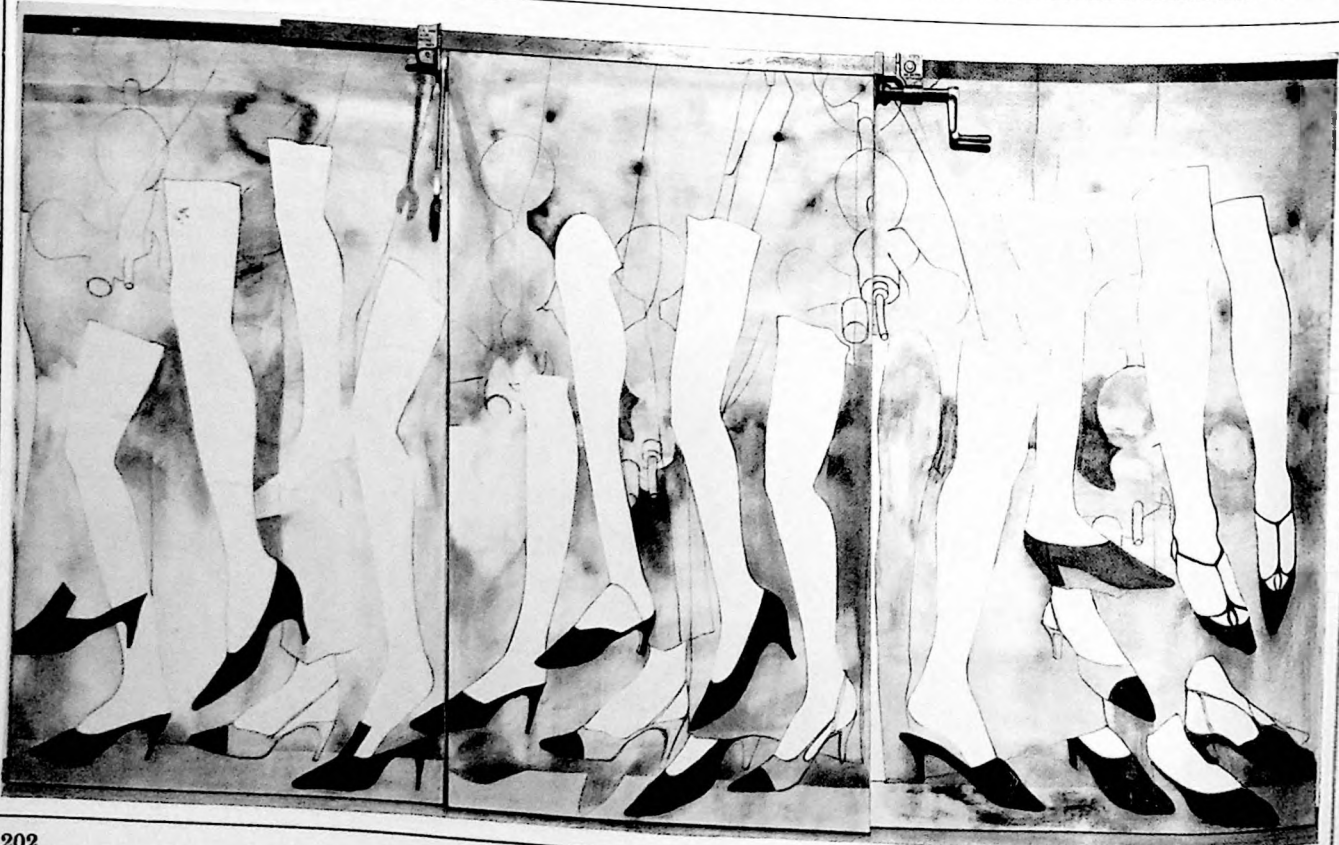
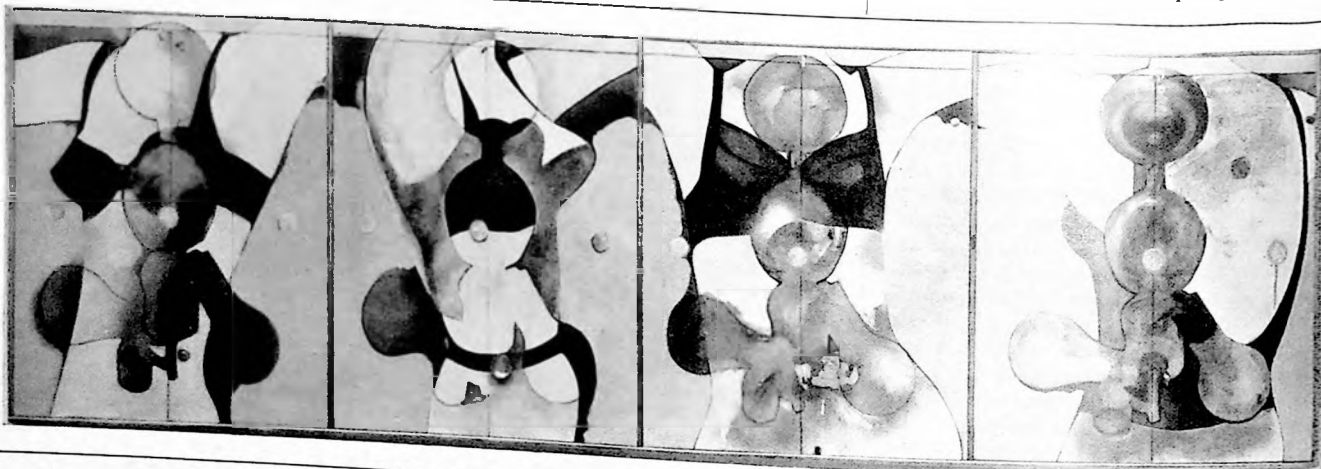






he has gone back on his sense of the necessity to paint in terms of a 'tenser and less explicit degree of representation,' and I have a suspicion that he is attempting to paint what he calls a 'complete work.' I think that in this picture he is trying to be a twentieth-century Seurat. It scarcely needs to be said that technically and spiritually it is denied him. Finally, he has recoiled from his own innate linearism, and is attempting to make everything all of a piece by painterly means. Pic-

tures like the large *La citrouille et les toils*, 4, may well be the reason why Velasquez appears in his list of 'complete' masters. In *La citrouille* there is a pervasive greyness that brings everything together in a caricature of a unified vision. One respects the attempt to take things quietly and stop interfering, but he doesn't know how not to interfere. It's evident that everything has been stage-managed, that curtain and tablecloth have been adjusted and no effort spared to turn the pumpkin into an





ambiguity. He is no more capable of being impressed by reality than when he painted his best abstracts. He belongs to an age that only knows how to be piquant, and he would have done better to stay in the avant-garde, where they handle piquancy better.

Piquancy is, I imagine, Jim Dine's strong point. I can't say for certain because I didn't find his latest things at the Robert Fraser Gallery particularly stimulating, but I am well aware that other critics consider them to be utterly with-it and the very last word in serious, subtle and sensitive gimmickry. When I saw that outstanding washbowl fixture on his canvas at the Guggenheim exhibition at the Tate and noted the significant contrast between the flashing white of the bowl and the flashing black of the brushstrokes which he had slapped around it with such breath-taking virtuosity. I thought to myself, "This Jim Dine is a sort of John Singer Sargent *manqué*," and the new things strengthen my conviction.

He is a refined academic draughtsman who makes nice thin drawings of common objects such as light fittings, and nice thin flat chic drawings of parts of the female anatomy which suggest that he has about as much interest in women as a male dressmaker. In *Four Bodies*, 5, where the light fittings enter the pink torsos like grey ghosts, a real hook is screwed into each torso, near the top of the picture, and if the bodies were less bodiless tiny sadists could squeeze a little pleasure from the thought that the torsos are hanging from them. The rather more intrusive clamp, ostensibly holding together the three canvases that make *Walking Dream with a Four Foot Clamp*, 6, is perhaps a boss shot at a symbol of the male embrace. The real clamp has a painted shadow, just to show that Dine is as deeply concerned with problems of illusion and reality as Jasper Johns. But apart from all this nonsense, the flat pink legs, jet black shoes and soft grey background delicately marked with outlines of light fittings add up to a very pretty picture. In other times, Dine might have been a flash portrait painter, and it's a reflection on our time that he is regarded as a leader of the avant-garde.

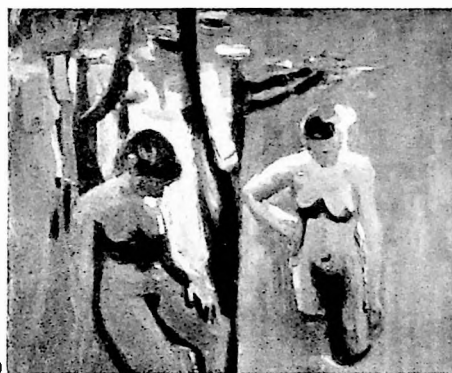
In a recent exhibition at Marlborough Fine Art there were two medium-size paintings, one by Corot, the other by Courbet, which treated the same subject, a female nude reclining in the open air. The Corot was painted when he was over seventy and was looking back at nature and reality as if they were in the past, wrapped in a golden dimness. His nude of a young girl is unbelievably sentimental, and ought not to be called *Jeune baigneuse*, 7, but something nauseating, like *The Age of Innocence*. It's as near as the human image can be brought to the appeal of

the fallow deer in its first year, and if it were not by Corot one would take it for granted that the artist was pandering to public taste. Courbet's nude, 8, is a splendid example of what Zola called his 'meat and potatoes' way of painting. She is the marvellous result of unprejudiced observation. She is just herself, the victim neither of symbolism nor of some half-solved problem of form. The boldness is from the woman's own figure; the image is unassuming. It is the nude by the mild and gentle Corot that has been molested.

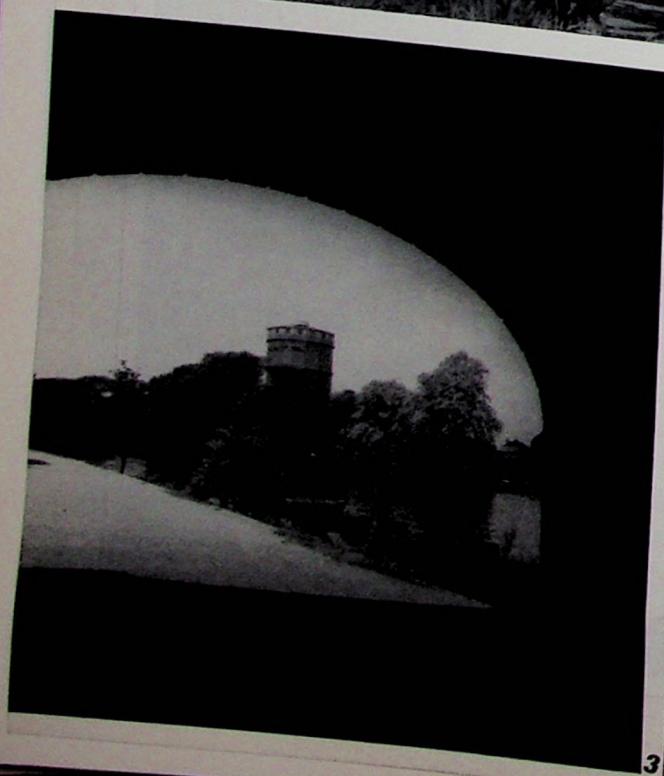
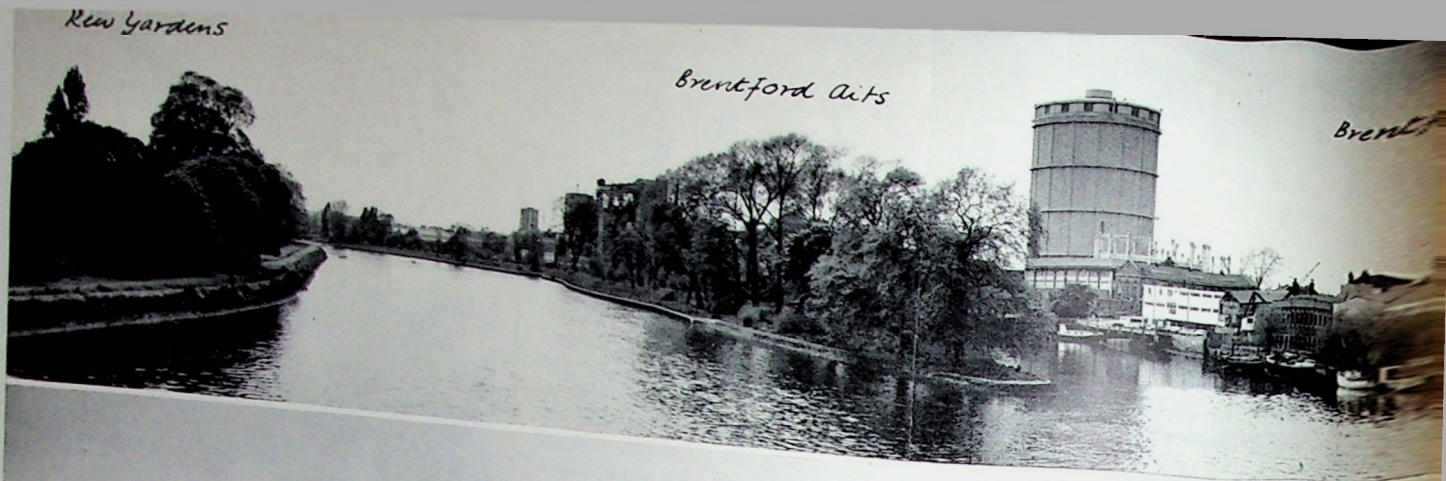
The exhibition of paintings from an American private collection held at Chelsea Art School included interesting representational paintings by the Californians, Robert Diebonkorn, David Park and Elmer Bischoff. They practise a sort of painterly realism and take their cue from the large, free gestures of the action painters. The subjects are female nudes in rooms and out of doors, but the figures are not strong presences and leave one unconcerned. If the Corot nude is a victim of symbolism, the nudes of David Park, for instance, 9, are perhaps victims of a half-solved problem of form. One feels that they are there to demonstrate the artist's handling of paint and at the same time to put a brake on random brushstrokes. If Pollock, Kline or Guston were in the collection, it would be clear I think that these realists are in two minds. As it is, action painting is represented only by Vicente and Stamos, who push the paint around without



much sense of purpose, and the realists, with their show of interest in light and space and the human figure, certainly have the edge on them.







**Brentford's riverside as it is now:**

1, from Kew Bridge looking west—an end-on view of tree covered islands, with Kew Gardens left and Brentford riverside right.

2, 3, view from Kew Gardens towpath; industry romantically screened by island trees.

4, a good and nearby example of the relaxed riverside vernacular, essentially human in scale, which it is important to preserve: Strand on the Green, east of Kew Bridge.



Kenneth Browne

TOWNSCAPE

# Brentford Riverside

A STUDY OF THE EFFECT OF RECENT PLANNING PROPOSALS ON ITS SCALE AND CHARACTER.

The strangely romantic, almost inaccessible, north bank of the Thames between Kew bridge and Syon Park is familiar to thousands who have admired it from the opposite towpath.

First from Kew bridge itself, 1, there is an end-on view of tree-covered islands, the Brentford Aits, and behind them a shaggy but picturesque foreshore of wharves, timber yards and the odd boathouse. Everything curves with the sweep of the river and the whole scene is dominated by a monumental gasholder.

Then, from the towpath adjoining Kew Gardens, you look across to a screen of Claude-like trees, 2, dense foliage making a perfect backdrop for the chain of deep-laden barges or the smooth glide of the lone sculler absorbed in his private world.\* Out of the trees and part hidden by them rise unlikely shapes, an Emmett world of gas-works machinery of gantries, gasholders and smoke stacks.

Eventually, going upstream, you reach the dream-like vista of Syon Park. Here the Northumberland lion dominates the roof-line

of Syon House and in the foreground thoughtful herons ponder one-legged in the reeds; something worth seeing on a misty autumn day.

But this mesmeric riverside, at any rate as far as Syon, will radically change if plans published recently for the Brentford and Chiswick council actually come about. As a final gesture before being swallowed by the new GLC borough of Hounslow, the borough of Brentford and Chiswick commissioned a planning study of this whole river frontage from Strand on the Green to Syon Park.†

The need for it was brought home by the hungry advances of a property company in 1963 intent on developing a large chunk of the borough. But also there were particular local reasons for regarding this stretch as ready for reconstruction, such as the imminent closure of part of the large gas works plant and the willingness of the Gas Board to sell, the council's purchase of a large part of the Metropolitan Water Board land to the north of this and the possibility of acquiring further large areas of railway land beyond that again.

In consequence planning consultants were asked to carry out a study showing how all this area might best be used. On their recommendation, the area of investigation was enlarged to the 500 acres between the new A4 viaduct on the north and the river on the south and between Strand on the Green to the east and Syon Park on the west, a river frontage of 1½ miles. Of this, the 100 acres from Kew Bridge to Ealing Road now mainly occupied by the gas and water works was considered by them to be ready for immediate comprehensive redevelopment and has been planned in some detail (see model, 5, below); the remainder has been considered in outline only.

The consequent report of January, 1965, is described as only a preliminary statement; as first thoughts put forward with the express intention of inviting comment.

Briefly, the main proposals for the first 100 acres are:

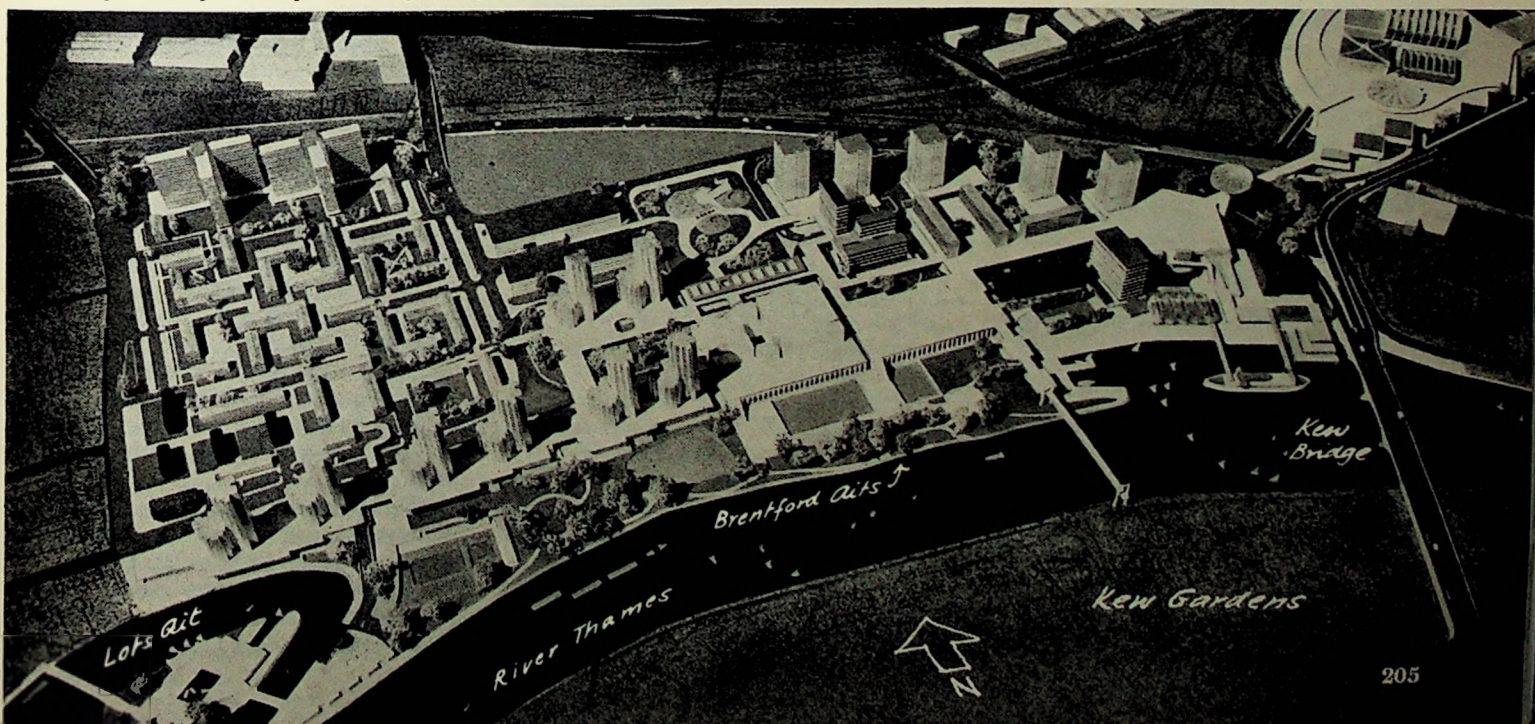
(a) To open up the whole length of the north bank to public access.

(b) To fill in the river bed between the Brentford Aits and the north bank and to lay out water-gardens, swimming pools and lawns on the land reclaimed from the river

\*Recently the trees have been greatly reduced; the effect shown in the photograph could and should be recovered.

†Brentford's Riverfront. A survey and preliminary plan by Max Lock and Partners, 1965.

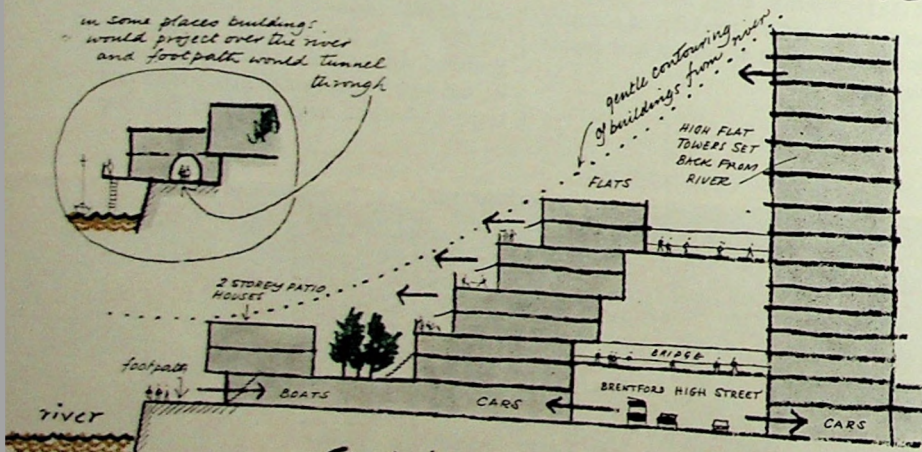
5 model of scheme for Brentford's riverfront by Max Lock and Partners described above.



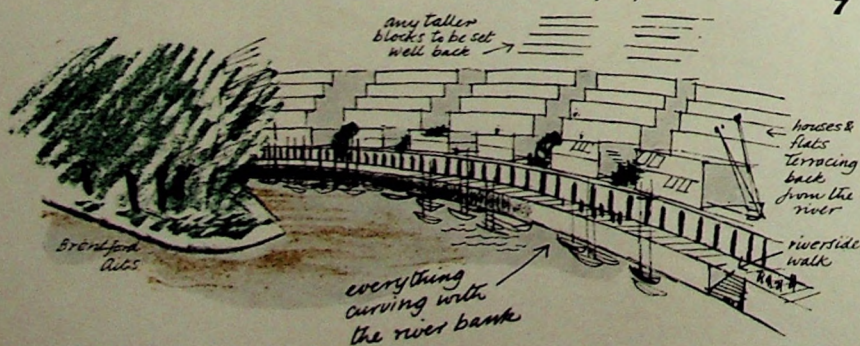




The Riverside at Brentford — as it could be 6



Section showing contouring of buildings and riverside footpath 7



and to build a footbridge linking across to Kew Gardens.

(c) To construct yachting marinas at Lots Ait and Brentford Dock with low riverside housing at the latter.

(d) To create a mile long upper level parade on the roof of extensive riverside car parks with banqueting and assembly halls rising from this upper level and also an international conference centre, hotels and restaurants.

(e) To carry out extensive rehousing, particularly north of Brentford High Street, two-thirds of it in high blocks. South of the High Street and rising again from the car park podium to build 500 riverside flats in six very tall blocks.

(f) To move the present wholesale fruit and vegetable market out of the area, and on the site build an interchange car park linked to the motorway with an entertainments centre over it.

(g) To remove the gasholders and reservoir to the north end of the site between the railway and the Great West Road and so free the riverside from industry.

(h) To stop through traffic using Brentford High Street and divert it on to a new relief





road immediately south of the Waterloo-Richmond line. To bridge over the High Street to facilitate movement across the site.

(i) To carefully preserve the two charming residential areas of Strand on the Green and the Butts.

#### COMMENT

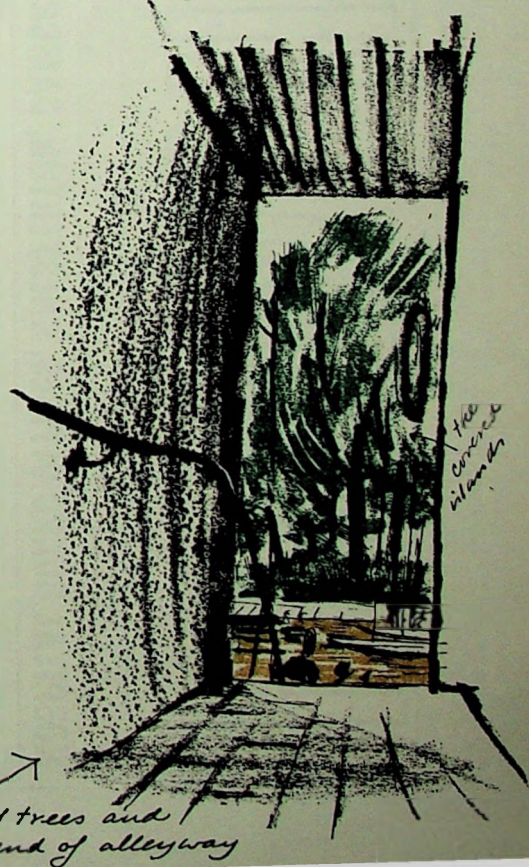
Brentford is indeed very run down and badly needs someone to look at it as a whole. Indeed it is almost too late as far as old Brentford is concerned, for the High Street has been reduced to a visual shambles by ill-advised road widening (now unnecessary?) and most of the old buildings have been knocked down and replaced by underdone bits of Harlow set back at odd angles with no control and no sense of space. To bring any kind of order here is going to be difficult. All the more welcome then is a serious planning study such as this, which analyses the problems in some depth. However the rather grandiose character of some of the proposals and an apparent disregard of the curve of the river (very important from Kew bridge) must give rise to doubts about certain aspects of the scheme

as it stands. No one would question that, as the consultants say, Strand on the Green, 4, is a gem which must on no account be touched while the Butts only need careful reclamation. Furthermore the greatly improved boating facilities they suggest would be excellent and just what is needed. (Incidentally, in moving the waterworks it would be well worth keeping the watertower which is a handsome ready-made vertical feature.) Most important though from the viewpoint of London generally is the overall treatment of the north bank itself, particularly as seen from the Kew side. It has certain qualities now which can easily disappear in a grand gesture or well intentioned clean up. In the first place it is important that the Brentford Aits should remain as separate islands and not be joined to the north bank, and one at least should stay wild with moorhens scrambling up its banks. Encourage people to go everywhere, with clean gravel paths to protect their shoes, and you defeat the whole object of escape from the city. There should still be cover for wildfowl, fishermen and lovers in skiffs. Anyway, what's the fun of looking across to a tame bit of municipal gardening? (and tame it certainly would be if efforts at Twickenham and Hammersmith are anything to go by). In fact from this report you get the feeling of an active dislike for these shaggy untamed islands; also for the muddy water between the islands and the north bank,

which would be replaced by clear, sparkling, aerated pools. This savours rather of TV advertising and Scandinavian hygiene and is perhaps overdoing it. After all this is a working river and mud and barges are all part of it.\* By contrast, it would be better to thicken the foliage, again intensify the mystery and not make it all too easy and too accessible.

Also, in any new building here it is surely most important to keep a sense of riverside immediacy, as at Strand on the Green; barges and boats of all kinds moored right by the houses which in turn are only separated from the water's edge by a narrow footpath. Set everything back behind tidy water gardens and all the impact and excitement will evaporate. Anyway, a gigantic upper deck promenade high in the air, as suggested in the report, would be pretty bleak and unappetizing much of the time. Surely the place for a river walk is beside it, with strange water-plants sprouting from the towpath wall and houses terraced back from it, 6, and with occasional alleyways leading down to the water, 9. Everything needs to be articulated with the curve of the river and the taller buildings should be kept back from it (see section, 7, and sketch, 8). The very high riverside blocks suggested in the report would not only over-dominate the river but almost certainly destroy the privacy of Kew Gardens. To confirm this you have only to see how the present gasholder, fine as it is, overpowers Kew Palace from the Broadwalk.

\*But by locks it would be possible to keep the water level up.



9 Slot view of trees and water at end of alleyway



# HOSPITAL HEADQUARTERS

## HOSPITAL BOARD OFFICES, CHESTERTON, CAMBRIDGE

photographs by H. de Burgh Galwey

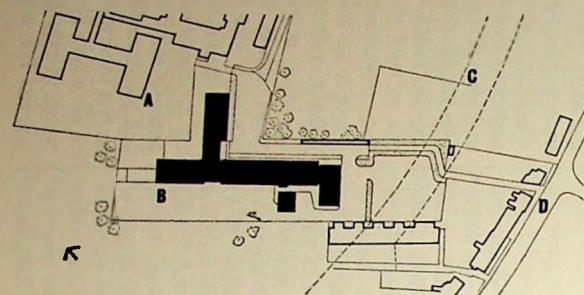
architects **JOHNS, SLATER AND HAWARD** in collaboration with **GUY ALDIS** architect to the East Anglian Regional Hospital Board

These buildings provide centralized offices for the East Anglian Regional Hospital Board which has hitherto occupied scattered buildings in the Cambridge area. The site is behind Chesterton Hospital, and vehicular access to it is through a narrow neck of land alongside the hospital. A new relief road is however to be constructed between the new buildings

departments, which occupy a four-storey block, a boardroom suite which shares a single-storey wing with the main entrance and a Hollerith plant which needed to be in a separate block because of the noise of the accounting machines. The plant occupies a single-storey wing on the opposite side, and the boiler-house another.

The structure consists of load-bearing brick piers and walls, with reinforced concrete spine columns and flat slab floors in the four-storey block. The spine columns rest on a reinforced concrete crawl-duct housing the main services. The Hollerith plant block has a lattice steel roof with reinforced wood-wool slabs, and the boardroom and entrance wing a timber roof, pyramidal over the boardroom itself, covered with copper and with a central rooflight. Facing bricks are silver grey; precast concrete edge-beams have a limestone aggregate bush hammered. Windows are aluminium in cedar frames. Heating is by under-cill convectors, with radiant heater panels in the boardroom.

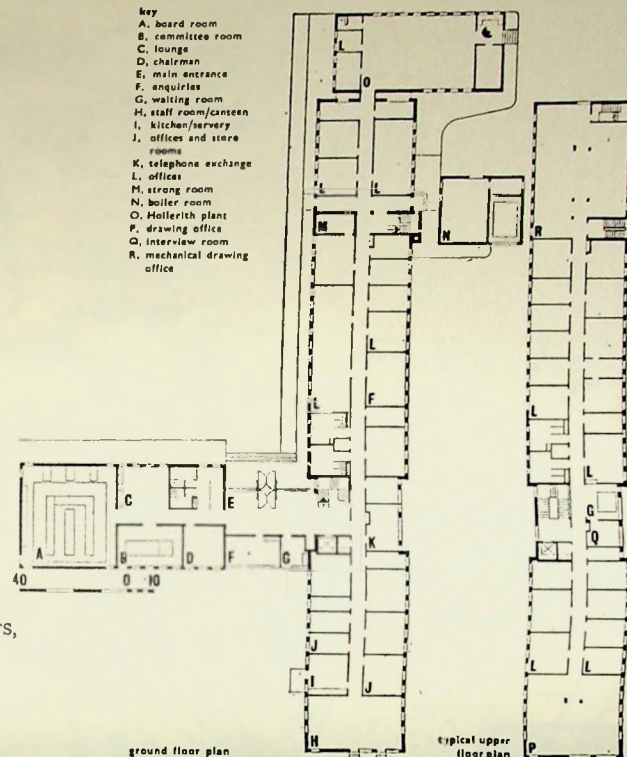
Partners in charge, Birkin Haward and W. Carpenter. Job architect, D. Hendry. Structural engineers, Charles Weiss and Partners. Mechanical and electrical engineers, Troup Bywaters and Anders (in collaboration with Maurice E. Burke, regional engineer, East Anglian Hospital Board). Quantity surveyors, Lewis and Marshall.



site plan  
key  
A, Chesterton Hospital, new extensions  
B, Hospital Board offices  
C, proposed line of new road  
D, Chesterton Road

and Chesterton Road, which will reduce the area of the site but will allow access from this side. The layout of the buildings was determined by the L-shaped site, by the need to allow for the complete reversal of the direction of access at a future date and by the need to maintain a shared access to the hospital laundry. The accommodation includes offices for the Board's six

key  
A, board room  
B, committee room  
C, lounge  
D, chairman  
E, main entrance  
F, enquiries  
G, waiting room  
H, staff room/canteen  
I, kitchen/servicing  
J, offices and store rooms  
K, telephone exchange  
L, offices  
M, strong room  
N, boiler room  
O, Hollerith plant  
P, drawing office  
Q, interview room  
R, mechanical drawing office



ground floor plan

typical upper floor plan

1 (opposite page), the office block from the south-west.









**HOSPITAL BOARD OFFICES,  
CHESTERTON,  
CAMBRIDGESHIRE**



The main entrance: 2, from the outside and 3, from the inside. 4, the service area at the rear of the building with the single-storey wing housing the Hollerith plant in the foreground.





Born in 1929 and trained at the Carnegie Institute, Pittsburgh, Victor Lazzaro has for the last three years run a small architectural practice in Connecticut. Besides this he teaches in the Interior Design Department of the Pratt Institute, New York and works as a freelance illustrator. Although his work in this field has been fairly general—book jackets, magazine illustrations and so on—his special interest naturally enough is architecture. He has travelled a great deal and from sketches made in Europe and America he develops what he calls 'fantasy drawings', elaborating and inventing as he goes along.

contemporary draughtsmen

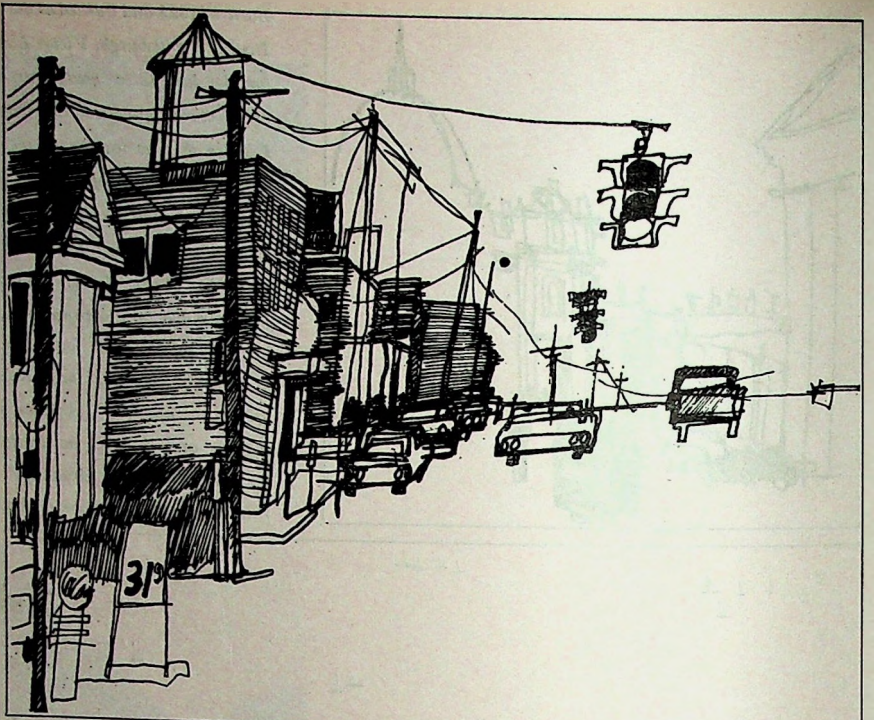
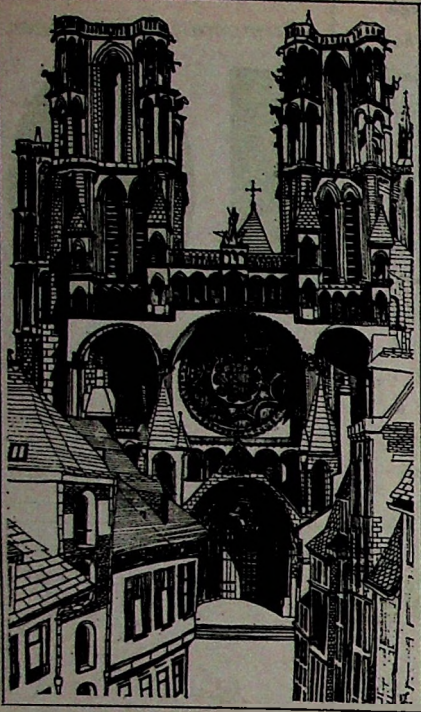
# 10

Victor Lazzaro



Top, St. Peter's, Rome. Above, Venetian fantasy.





Left, Leaning Tower of Pisa. Right, small town, USA. Below, rooftops fantasy.







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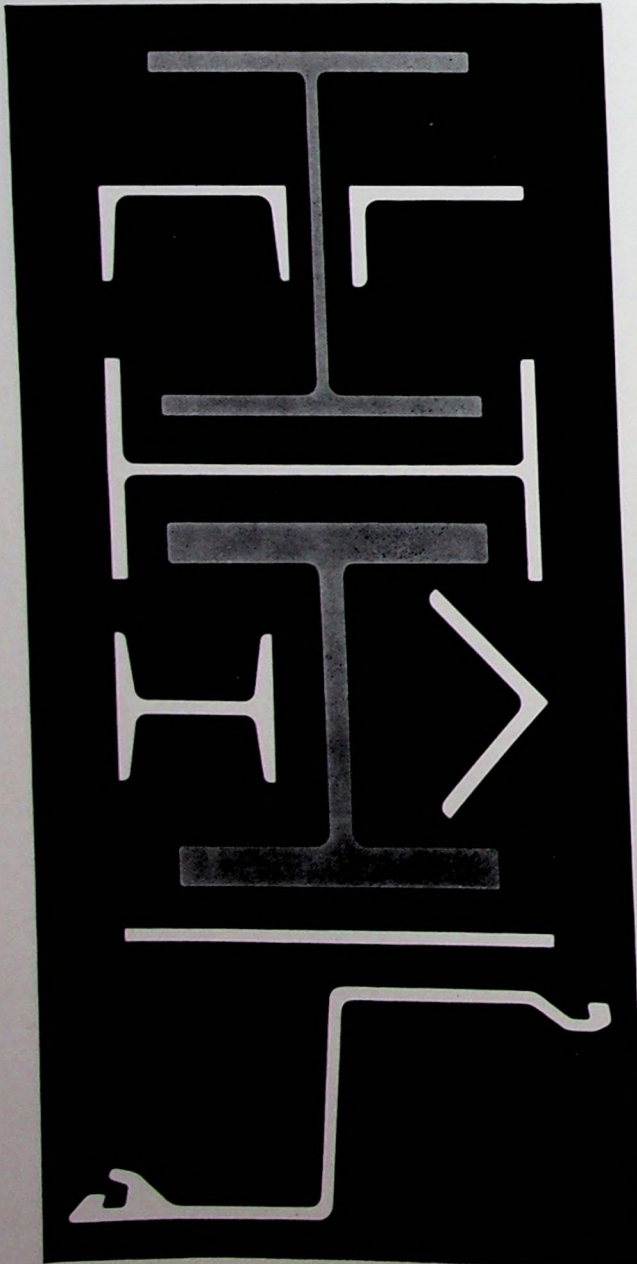
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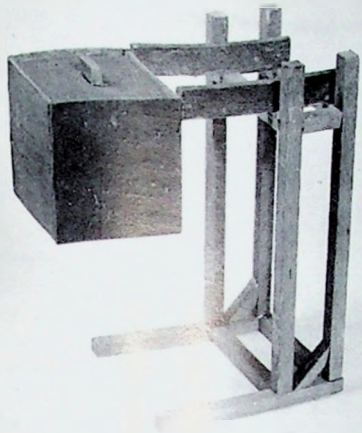
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travel

# SURPRISE IN ISLAM

The marvel of the ceramics in Persian Islamic architecture has meant that although much work has been concentrated on the decoration and on dating, comparatively little (with the notable exception of Arthur Upham Pope's famous survey)\* has been written about the form of the buildings themselves. This article makes no claim to scholarship; it only records a few outstanding characteristics in the architecture of Islamic buildings which seem common to various types over a considerable period and which are particularly strange and exciting to a European today. They may well have made a similar impression on the seventeenth-century travellers; for there are certain features of the buildings of, say, Isfahan (but common also to

other cities) which not only astound by their audacity and splendour, but which demonstrate some of the radical differences between the approach of those Islamic architects and that of their European contemporaries as well as ourselves.

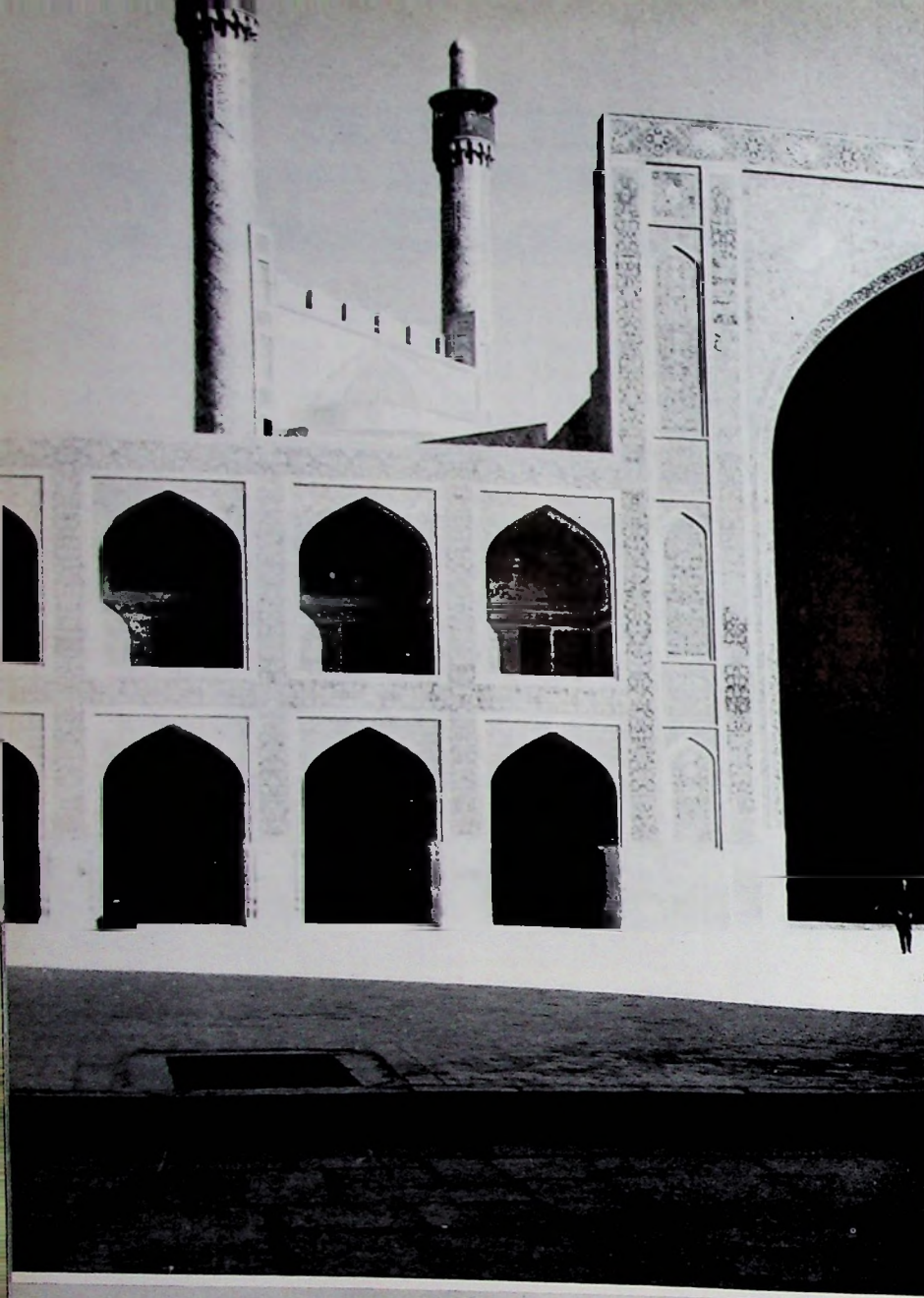
Lulled by centuries of tradition into a belief that certain rules are generally accepted which even the changes introduced by the modern movement have not altered, it is stimulating to see great architecture which seems oblivious of tenets which we take for granted. For instance in English building, be it gothic, renaissance or contemporary, it is generally understood that what is in sight is visible to the onlooker and must inevitably contribute to the form and composition of the building. In Persia this is not necessarily the case, as a glance upwards from the courtyards

4  
'only be described as a raised box, with a lid. The overall height would be 3 ft. 2 in. The joints of the actual box with the pieces of wood which hold it out would be strengthened with iron brackets.' 'I must admit,' he goes on, 'that if one put an extremely heavy weight entirely in the front portion of the box the whole thing would topple forward, but a simple remedy for this would be not to do so.'

\*Arthur Upham Pope: *A Survey of Persian Art*, Oxford University Press, London and New York, 1939.





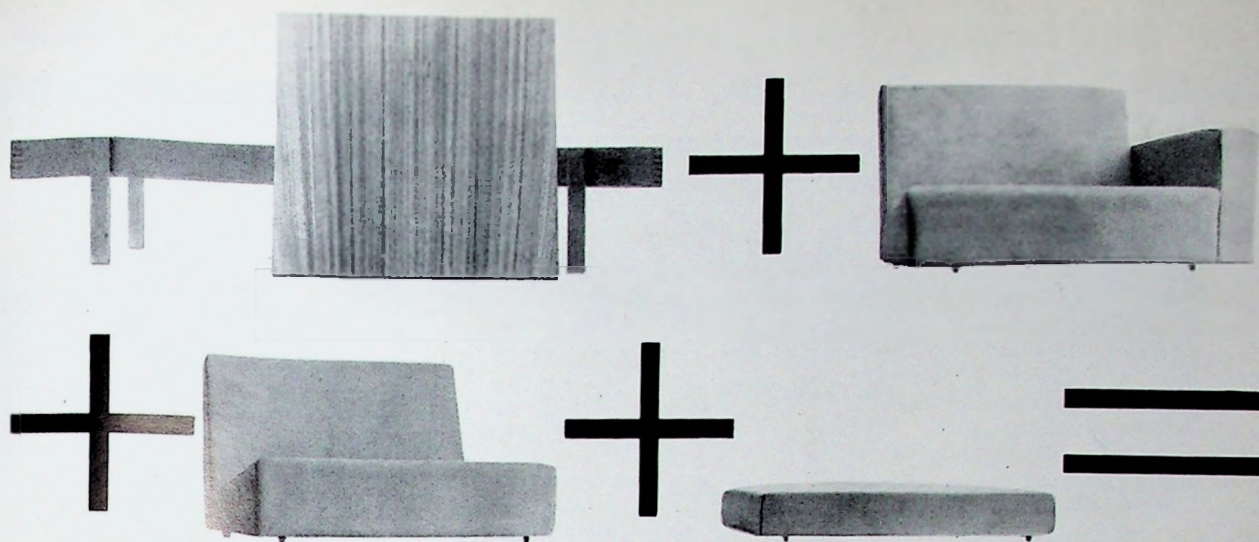


of some of the great mosques will show: a separate world exists above the tiled façades. Again we do not expect violent changes of scale; they may occur accidentally between two adjacent buildings—incidentally adding to the kick we get out of the townscape—but within one building abrupt change is usually considered less acceptable: architectural students are cautioned against it. Not so in the Isfahan created by Shah Abbas, where a ruthless change may be the catalyst which gives an almost overwhelming sense of occasion. Deviousness of plan is another key to success in creating drama. In a classic temple or medieval cathedral the main entrance is usually axial and focuses on the shrine. In some of the greatest Persian religious buildings, sudden changes of direction or unexpectedly circuitous entrances (usually dictated by the relative positions of Mecca and the entrance of the particular mosque) are admitted without ado and contribute tremendously to the dramatic impact. What at first sight might be supposed to be contrived surprise, turns out to be the result of brilliant handling of a practical planning problem.

The method of design or the way of looking at a building which allows the abrupt juxtaposition of highly sophisticated and decorated architecture ('seen') and, aesthetically unrelated to it, bold, unadorned, functional building forms, might be described as 'invisibility by mutual consent.' It seems that the onlooker should be unaware of the one while he is appreciating the other; only from a considerable distance or from particular positions should a building be considered as a whole. The royal mosque built by Shah Abbas at the end of the Meydan (the great square in Isfahan) provides numerous instances of this kind. The view, 1, of the mosque from the *talar* of the Ali Kapu pavilion, from which the Shah watched the extraordinary spectacles staged in the Meydan below, was presumably an important one. To a foreigner it presents an extraordinary architectural spectacle: a strange and romantic mixture of the elevational architecture of the tiled façades, the sculptural quality of the great tiled dome, contrasting with the very exciting 'back-stage' forms of the plain mud-brick vaults and domes of almost brutal simplicity behind the main façades. But this roof-level spectacle is comparatively distant. The real shocks are to come. Inside the splendidly proportioned courtyard of the mosque the deep sense of awe engendered by the simplicity of its shimmering blue arcading broken only by the great *ivans* in each side of the quadrangle, can be suddenly jolted by the (to us) incongruous sight, 2, of the back of the great entrance portal rearing between its minarets; its







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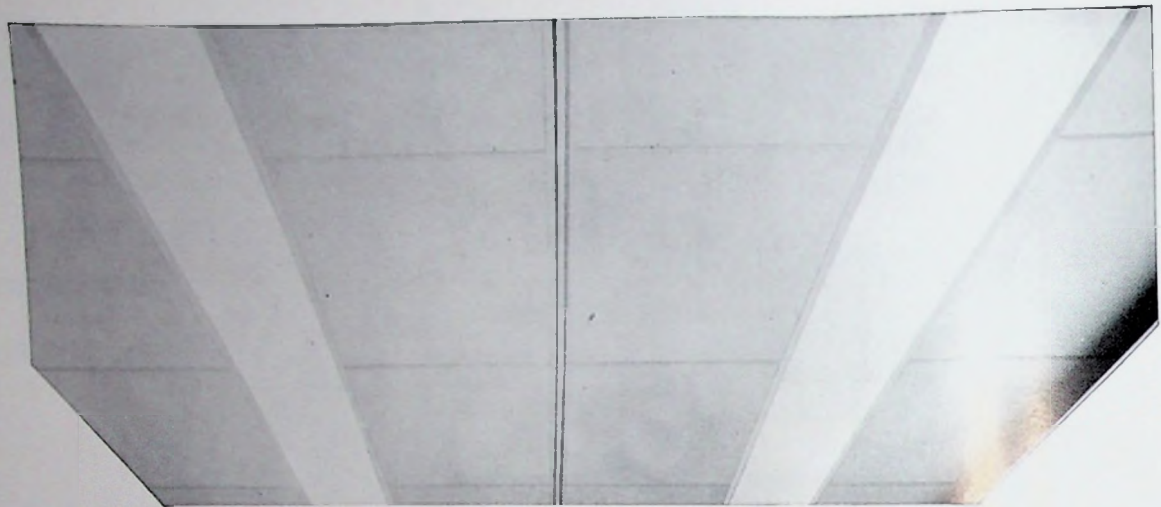
the extensive range of Hille fabrics. In addition two related armchairs and low tables are available.

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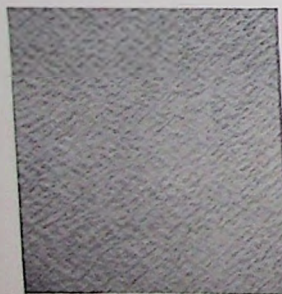
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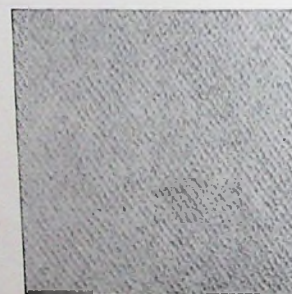
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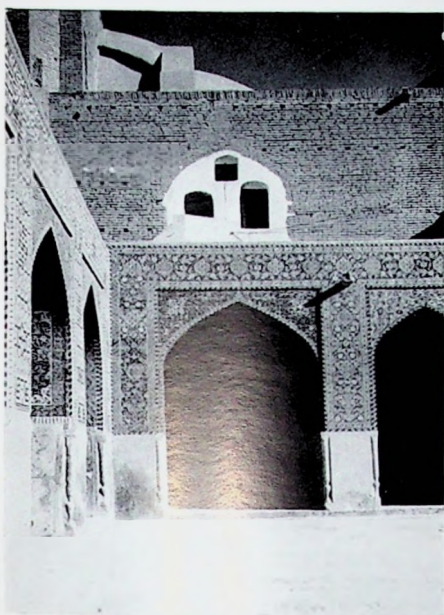
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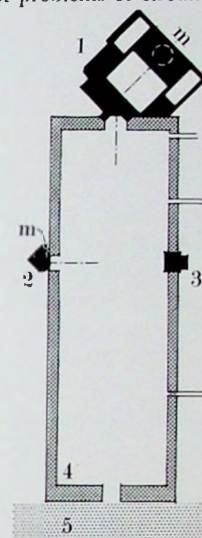


unselfconscious statement makes some twentieth century expression of function seem by comparison quite tame. Within the side courtyards similar surprises occur in the plane of the elevation, 3 and 4. The surprise is not just the straightforward statement and lack of adornment of the great mud brick walls raised above the finely tiled arcading (the walls might have been unfinished), but the splendid disregard for what lies below.

When wandering round this magnificent building there is repeatedly a sense of having glanced through into the wings behind the proscenium arch, where, instead of glimpsing the flimsy props, one is confronted with an architecture as exciting, if not so sublime, as that seen from front-stage. This very strangeness, far from detracting from the building, initially adds to the European's enjoyment of it. But after a week or two these violent contrasts have ceased to register; the convention of partial invisibility has been unconsciously absorbed. It seems probable that the climate plays an important part in such acceptance. On the Iranian plateau, where for most parts of the year the light is exceptionally strong and the glare intense, the eyes (except of ardent sightseers) do not wander to the dazzling blank sky, and so to those higher structures seen at relatively close quarters against it. This is particularly true of objects with pale light-reflecting walls of plain mud brick. Lower walls, particularly if they are of light-absorbent colours like blue tiling, and even more so if they are broken by the deep shadows of arcading, are so much easier to look at that the eye tends to wander round them at low level and only to rise above the arcading when it is led by more tiling up the face of the *ivans* and so on

to the minarets and main dome. It is as though the tiling provided an acceptable route for the eye to follow. In a more temperate climate it would constantly skid off the circuit.

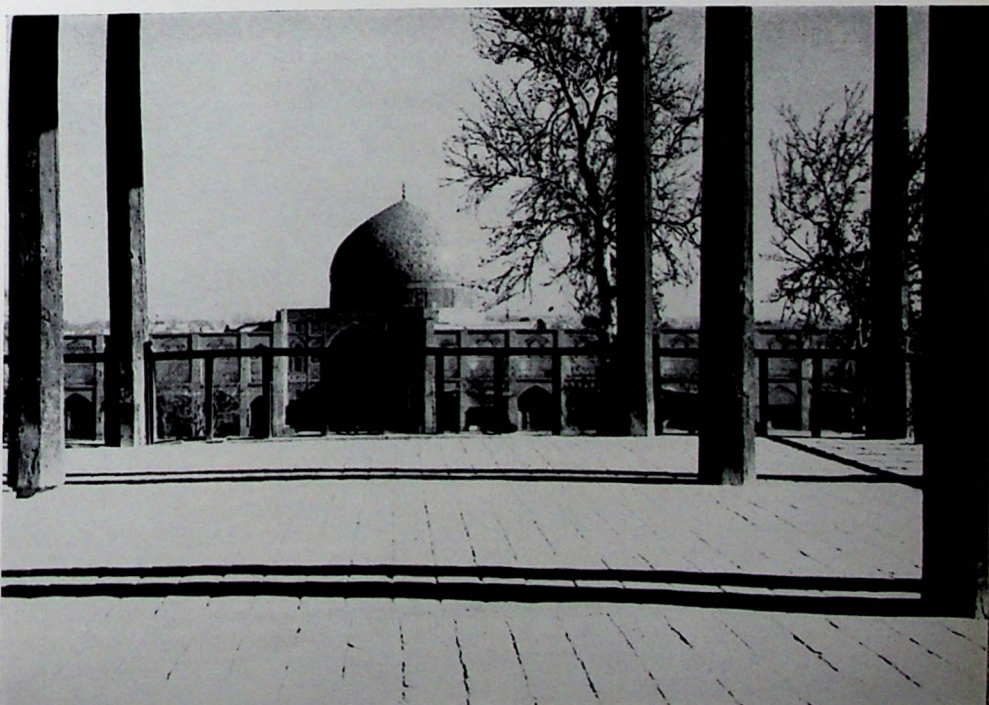
On plan, too, the mosques produce unexpected drama, but this evolves from the functional solution of problems of circulation rather than from contrived surprise. The assured handling of what might have been considered an obstacle has added immeasurably to the impact of some of the greatest mosques; in others the congestion of the bazaars or the humility of the mud-paved alleys immediately outside the entrance give the same dramatic contrast. The great portal of the Masjid-e-Shah looks squarely down the Meydan itself giving no hint of the sudden change of axis which lies immediately behind. Lulled by its symmetry into a state of ordered expectancy, those entering pass through the low doorway under the soaring arch to find their approach suddenly halted — see plan. The focus of attention has been pivoted through an angle of 45 degrees in



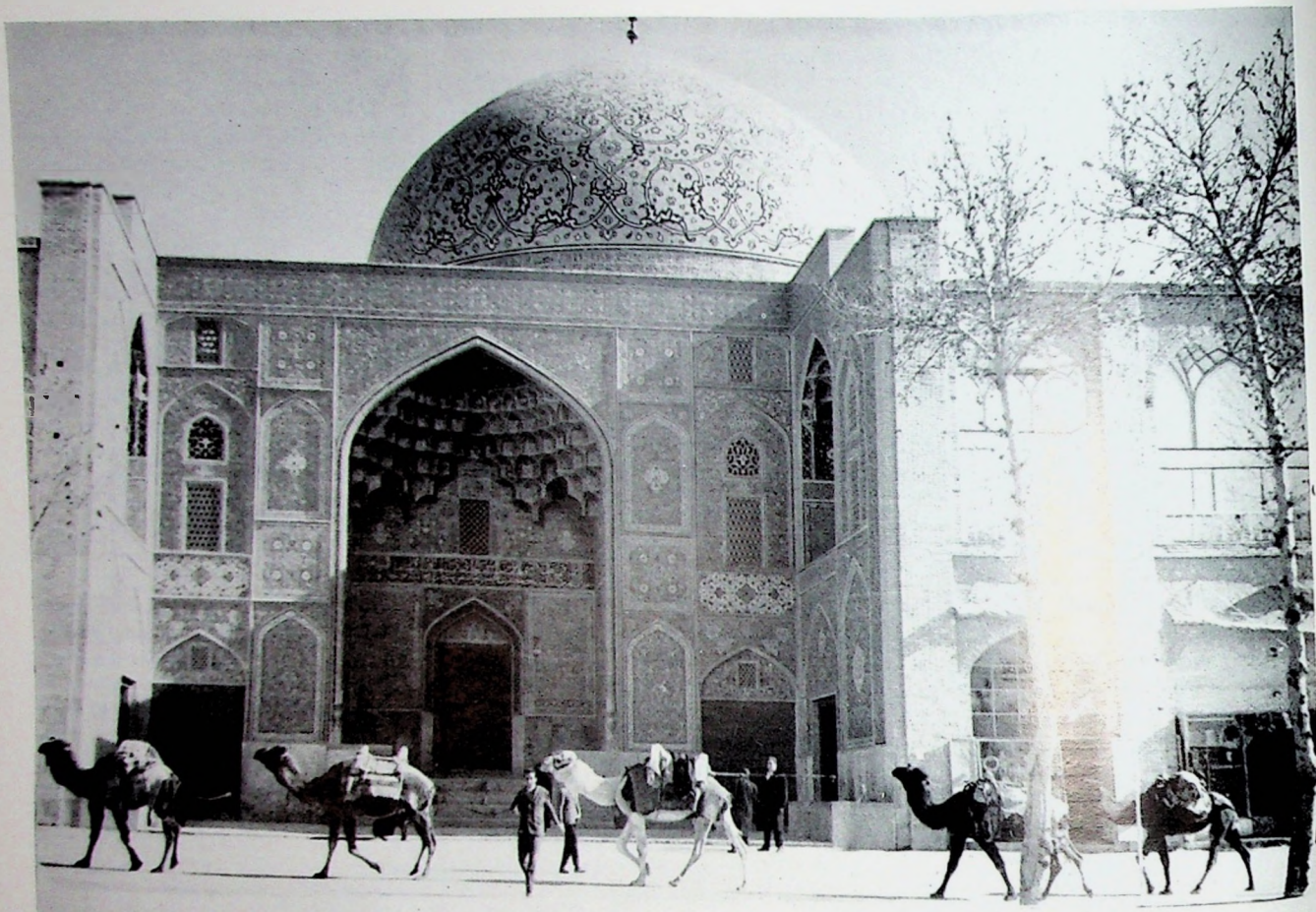
Plan of the Meydan-e-Shah, Isfahan. Key: 1, Masjid-e-Shah. 2, Lotfollah Mosque. 3, Ali Kapu Pavilion. 4, Meydan-e-Shah (500 metres long). 5, bazaar. m, mihrab on kibra wall, oriented to Mecca (i.e., south-west).

the circular vestibule and it is barred by a low platform which stretches across below the arch ahead; in the immediate foreground stands a splendid stone bowl which serves to arrest both the attention and the passage. To enter the mosque one must turn left or right down comparatively narrow passageways (not walled, but defined by the piers carrying the vaulting); these short corridors turn again to meet the great courtyard of the mosque at right angles. The worshipper is now facing the *kibla* wall of the shrine and so Mecca. For it is the geographical relationship of the holy city (to the south-west) and the north-south axis of the Meydan which the architect has seized and turned into something that stuns the stranger into a proper state of wonder and awe before he is even inside the great courtyard. The effect is momentarily overwhelming but dramatically superb. It might not have come off in northern Europe where the difference between light and shade is less intense. In a subdued light the sense of direction, necessary if the effect is to be maintained or (more practically) if crowds are to move smoothly or individuals find their way, might have been lost. But here the brilliant light of the Meydan, and the brilliantly sunlit courtyard beyond, are linked by the shade of the entrance (it faces north); the stranger is drawn in and turned as inevitably as a moth. Instead of a moment's hesitation he is spellbound by the shimmering depths of the courtyard and the *ivan* of the shrine.

A quite different sense of surprise is achieved in the exquisite Sheik Lotfollah







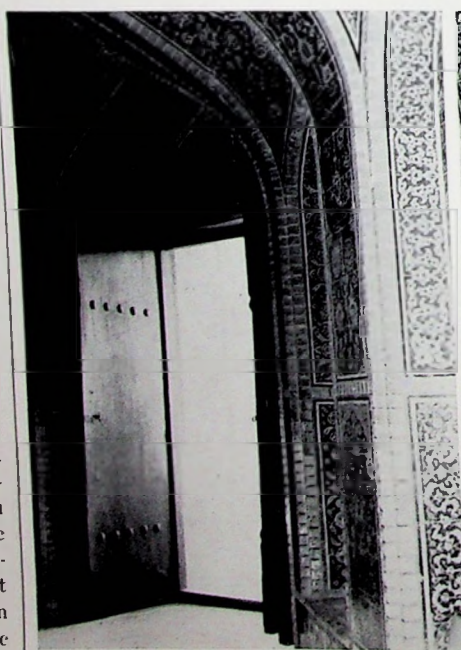
6

mosque, 5 and 6, on the east side of the Meydan. Again a curious eye might discern that something unexpected was in store since the dome hovers off-centre of the entrance portal. But this is the sort of thing that is spotted in elevational photographs rather than when a building is approached on the ground. Again the north-south axis of the Meydan and the position of Mecca had to be resolved. Here the entrance itself, 7, is at an angle to the broad passage inside. There is no doubt about which direction to take since no alternative is given, but neither is there any sign of the entrance to the dome chamber; instead, there is a passage with a right-angle bend, beyond which nothing can be seen. On reaching the corner one hopes the entrance may be visible. It is not. At the far end is a firmly closed door, 8. However a subtle change of light suggests that there might be an entrance in the right wall, and this turns out to be so. An unpretentious opening cuts the wall, whose great thickness, 8 ft. 2 in., enhances yet further the sense of enclosure and remoteness from the world outside. Suddenly you have arrived: above floats perhaps the most beautiful dome in all Islamic architecture, 9. The *mihrab* opposite is in fact only a few feet through the wall from the entrance door to the Meydan and the

outside world, where this circuitous pilgrimage began.

Lastly there is the dramatic handling of changes of scale. This can happen within the thickness of the wall; it may in fact be the great thickness of the interior walls that makes it acceptable; the tradition of

low doorways brings the scale right down not only in the private houses but also between the royal apartments in the Shah's palaces. In the Chehel Sotun pavilion, for instance, the famous columns of the *talar* rise without a break to the staccate capitals to support the splendid ceiling







SfB (63)

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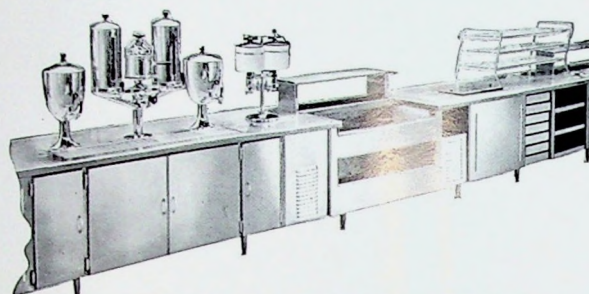
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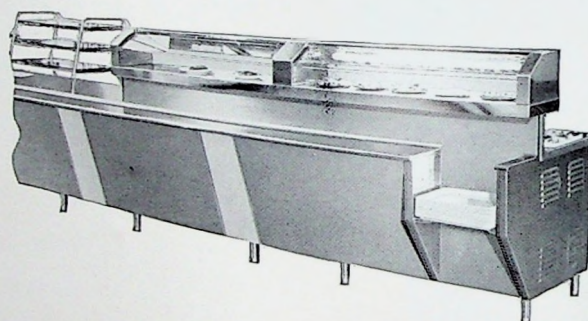


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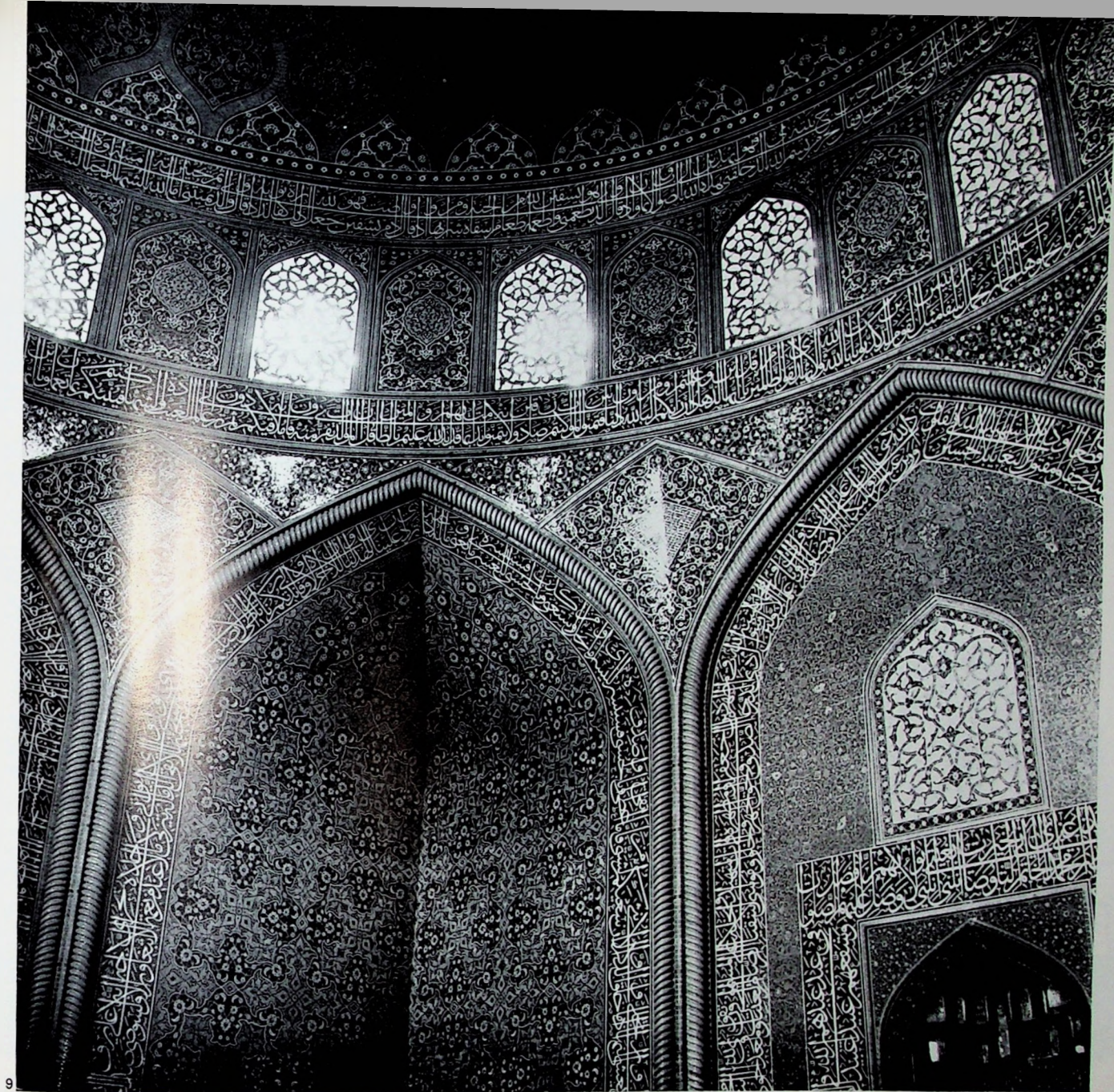
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9



10

which hovers about 48 feet above the paving, 10. The scale seems bigger than that of the poplar trees. The adjoining audience hall (approximately 72 ft. by 36 ft. by 39 ft. high) is entered by doors which are only 6 ft. 7 in. wide and 6 ft. 9½ in. high. The side apartments are delightful; the arcading which runs round the walls at door-head level brings down the scale to something which would not be out of place in a small private house, while the vaulted ceiling above gives a sense of space and air so necessary in a hot climate. This sudden reduction in scale seems typical of the other royal pavilions in Isfahan, for instance in the Ali Kapu, where the rooms on the higher floors are surprisingly miniature. Again the Persian addiction to alcoves and niches,

bound together as they are into continuous arcading, immediately creates an intimate scale, miniature by comparison with the *talar* below.

Perhaps the almost lunar scale of the landscape of the plateau has accustomed the Persian to sudden change. It is a common sight, after miles of seemingly empty mountains to come across a walled village with one small entrance door. Immediately the scale jumps from the vast to the individual. In England we are accustomed to the man-made scale of field patterns gently contrasted with the village scale of a collection of small houses. Perhaps these sudden changes, so typical of the plateau, have created a frame of mind in which abrupt change of scale is naturally accepted.

ELISABETH BEAZLEY



# NEWHAVEN KILNS

1



Four splendid examples of the functional tradition, which also make a notable addition to the fishmarket, 1 (built in 1896), are to be seen near the harbour in Newhaven, Edinburgh. These buildings, which are surrounded at ground level by a complex of sheds, are used as kilns for fish curing, and although it is not known exactly when they were built, local opinion estimates their age to be about 90 years. The kilns, 2 and 3, built of brick, are approximately 18 ft. by 12 ft. and have red pantile roofs surmounted by ventilators which may be adjusted according to wind conditions. The internal end walls of the kilns are lined with horizontal battens with a vertical spacing of about 1 ft., and these support the tendersticks which are loaded outside the kiln, and from which the fish are suspended during the curing process. Smoking is done by slow burning oak

224



2





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## 4 WAYS TO A MAN'S HEART—IF HE'S AN ARCHITECT

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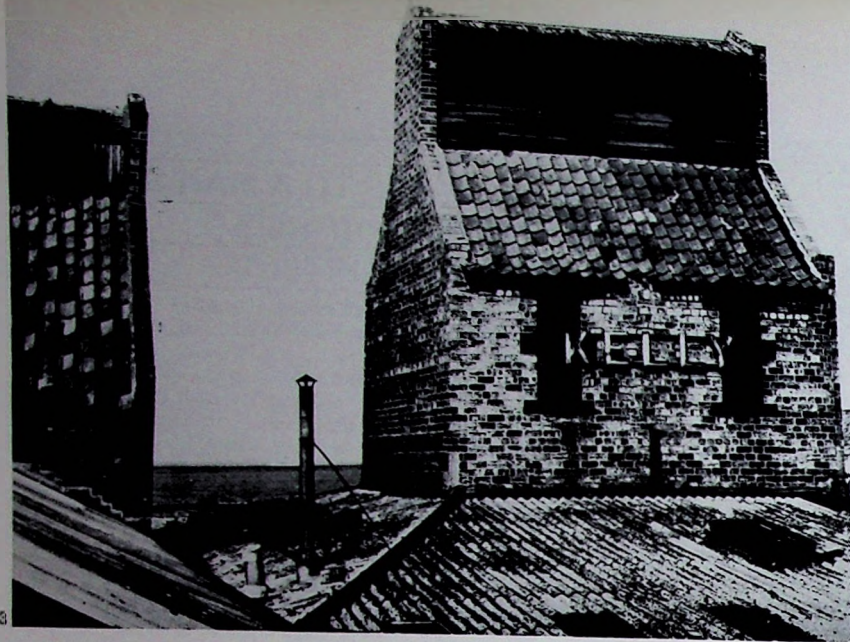
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shavings on the cobbled floor. Before electricity was introduced, the shutters, 4, were used to admit daylight when the tendersticks were being positioned in preparation for the curing.

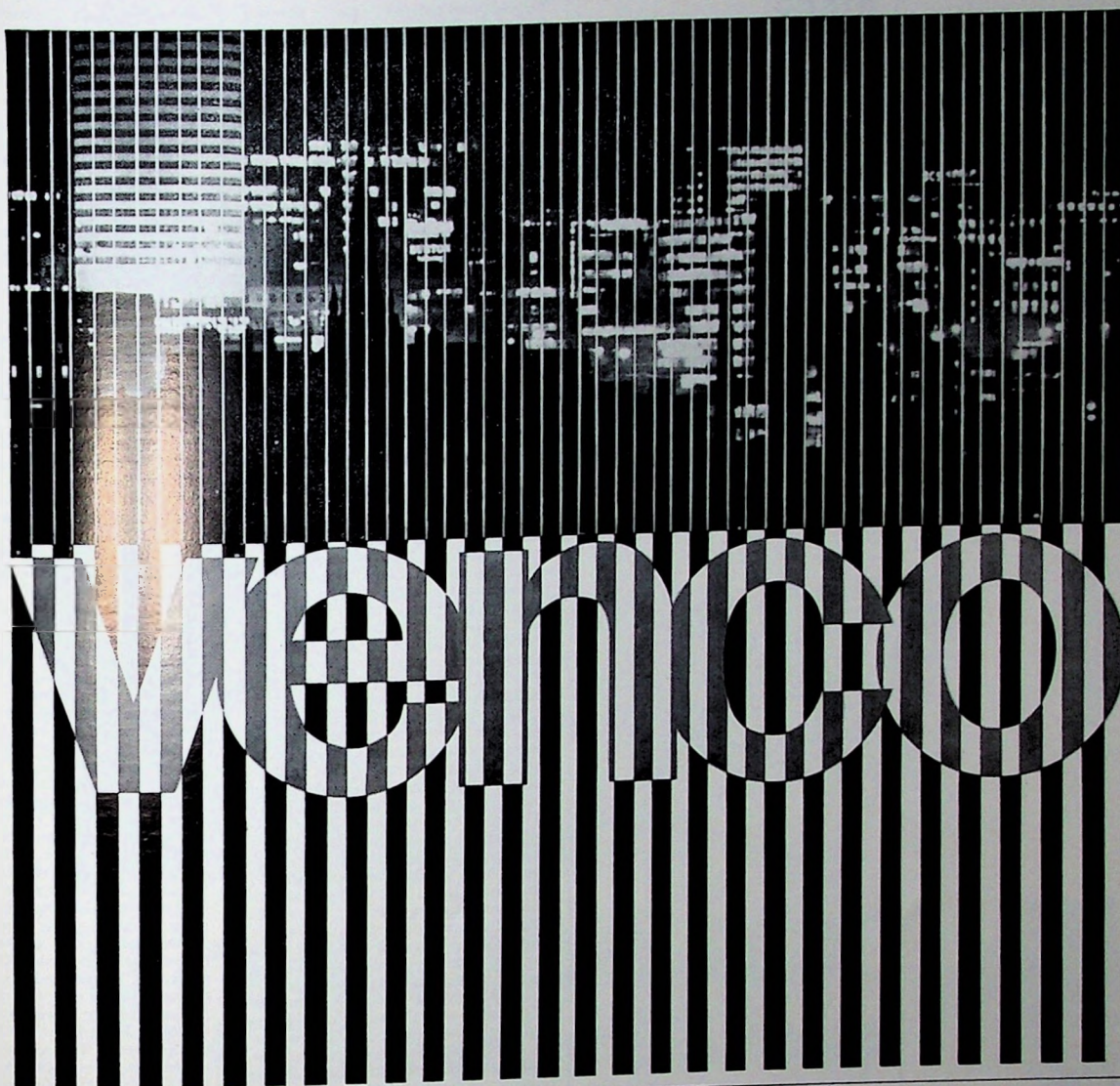
Not far away from these buildings is a further example in Main Street, Newhaven, 5. This particular building, of about 1890, accommodates four kilns, each about 16 ft. by 8 ft. They were formerly used for fish

curing, but two have recently been converted for bacon curing and two are no longer in use. A striking feature is the collective ventilator which at one time served all four kilns and apparently was a serious grievance to the local inhabitants. It is particularly interesting that these buildings are of brick—an uncommon material in Edinburgh—and since they are sited close to the harbour perhaps the material may be attributed to the ballast carried in ships returning from the Continent in the mid nineteenth century.

EDWIN JOHNSTON







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## Static Communications 1

*As more and more vehicles crowd into city centres it is worth considering whether the rapid development of static communications might not make a growing proportion of these journeys unnecessary. It is in any case clear that in the long run these techniques will exert a great influence on human activities and thence on planning. As a first step in appraising this situation Keith Harrison describes the systems now available in this country. In a later article he will consider how these might be put to better use.*

Telecommunications are serving many useful purposes in several branches of industry, commerce and business. They are being used not only for communicating but also for controlling all kinds of activities. They are effective and efficient services which often make radical alterations to the way activities function.

If we regard traffic as the functioning of activities, then telecommunications would seem to have a great potential, for they can change the way many things function so that they depend less on the use of a vehicle. In the future, when visual communication becomes an economic proposition for the individual as well as the large firm, we might adapt ourselves more to a static way of life which could have more than just a marginal effect on traffic. The potentialities however must not overshadow the dangers that are attached to any system which diminishes human contact. There are obviously many activities which will continue to rely both on people working together and on some efficient forms of transportation. Nevertheless it could be agreed that town planners and architects are getting things out of perspective when they see communication problems in terms of movement only. The scales seem to be heavily tipped in this direction, mainly because of the broad assumptions made regarding the future of the motor car.

It seems to me therefore that static systems of communication, some of which I outline below, may eventually help us to strike the kind of balance that is needed—particularly if town planners and architects begin to apply the techniques more skilfully than they have done in the past. Telecommunication services operate over wires, cables or radio waves. These are known as the transmission paths and they are under the strict control of the Post Office. There are limits to the amount of traffic each can carry and already many of them are overloaded in certain parts of the country, due to the growing demands of industry and business. The initiative for development and expansion to meet these heavy demands rests entirely with the Post Office, who have a monopoly. They are, however, not unaware of their responsibilities in this direction and have already embarked on a programme of expansion. Microwave radio systems are being extended to complement the underground cable system and the Post Office propose to have in the region of 125 stations in operation by 1968. The Post Office tower in London will be able to deal with 150,000 simultaneous telephone conversations and 40 or more television channels. Much work is also being done by private industry. For instance, STC have produced coaxial cables which are capable of handling a lot of traffic. Two coaxial cable tubes of only  $\frac{1}{4}$  in. diameter can now handle 2,700 simultaneous telephone calls.

The expansion of existing facilities and the development of new microwave links are of crucial importance since the transmission of information between two points has to pass over wires, cables, or electromagnetic waves. Telemetry, automation, remote indication and control depend on these transmission paths, and it would be a great pity if the development of these techniques in industry were held back suddenly because of insufficient networks throughout the country. The same thing will happen

to telecommunications as is happening now to the motor vehicle if the demands of industry and business outstrip the supplies of the Post Office.

### The transmission of words

Telex is one of the best known services offered by the Post Office. It is a 24-hour public teleprinter service which enables messages to be transmitted very rapidly. It has been aptly described as typewriting over wires. The equipment consists of a teleprinter and a dialling unit which is connected to an automatic telex exchange. Subscribers pay £40 a quarter and are able to send a written message to any of the other 15,000 or so subscribers in the Telex directory. The special number is dialled and after an 'answer back' signal has been received the message is typed on the teleprinter and is automatically printed at the receiving end. Time costs money, so obviously the quicker the message can be typed the cheaper it becomes. Automatic equipment, consisting of a tape perforating machine, can increase the transmission speed to about 70 words a minute. Telex is expanding rapidly all over the world and it is now possible to dial many European countries direct and at low costs. A one-minute call to France costs 1s. 4d., to Switzerland 1s. 8d. and to Finland 3s. 6d. The main advantage of Telex is that it combines the speed of the telephone with the accuracy of the printed word, which is particularly useful for communications with foreign countries.

Private teleprinter services are designed to meet the needs of those who require a more individual service. The equipment is similar to that used in Telex. Private lines are rented from the Post Office and any number of teleprinters can be connected to the special teleprinter switchboard that is located centrally in the customer's organization. The switchboard is rented from the Post Office at an annual cost of £45 per working line, and the annual rental for connecting lines anywhere in the United Kingdom is based on a special scale. The annual charges for a private line between say Harrow and London (12 miles) would be about £108 and for Newcastle upon Tyne to London (274 miles) about £500. On top of this would be the rentals for the teleprinter equipment.

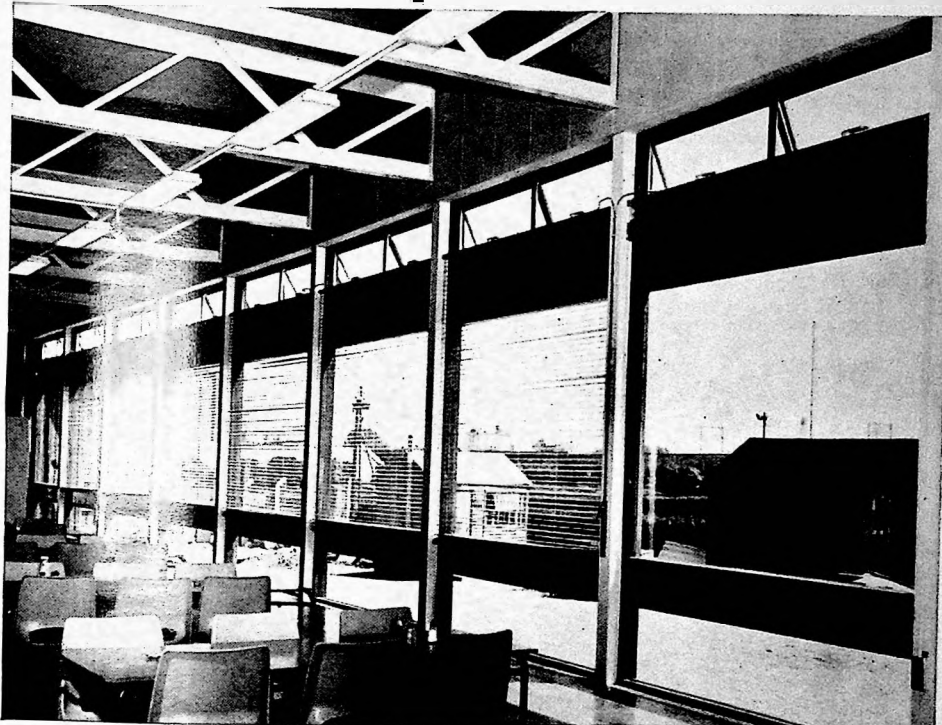
At the moment these services are being used for industrial and business activities but there is no reason why they should not be used for domestic and social purposes—such as theatre bookings, airline reservations, the sending and receiving of items of news, the ordering of goods and materials from large stores and supermarkets coupled with the direct debiting of accounts with banks on a credit transfer system. There are all kinds of possibilities and the housewife could save a lot of time and energy. In residential estates the service could be provided on a group basis which would reduce the costs considerably. It would be practicable too since many large organizations are already using teleprinters either privately or on Telex.

### The transmission of data

Computers are usually located centrally in an industrial or business organization and firms often have to depend on up-to-date information being fed into them. If the information is coming from different parts of the



# Clearly an open and shut case



(Photo: Marconi staff canteen, Chelmsford)

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London Office: 37 Duke St., St. James', W.1, TRA 1771, Midland Office: Birmingham, Midland 3021



continued from page 228]

country to the central computer then the transmission speed is important. Data for computers can be transmitted over telegraph or telephone lines and to meet the growing demands for data transmission the Post Office are providing special facilities known as Datel Services. They vary according to the speed of transmission required. The Datel 100 service operates over a telegraph circuit up to a maximum speed of 100 units per second. The circuit can be either telex or private. A telex installation for data transmission costs £300 per annum to rent; the charges for transmission are made in 2d. units and the time one gets for this varies according to distance. Private circuits are offered as an alternative to Telex circuits. One between Harrow and London would cost £168 per year and between Newcastle upon Tyne and London £900 per year. There are other services which cover a faster range of speeds and which operate over telephone circuits. They are known as Datal 200, 300 and 600 services. The '600' provides data transmission within the range of 600-1,200 units

per second and can operate over the public telephone network (on STD calls and charges) or over private speech circuits (at Tariff 's' rates). Tariff 's' rates for Harrow to London would be £168 per year and for Newcastle upon Tyne to London £2,100 per year.

There is an international datel linking the GPO Datel 600 service to the American domestic network. The service provides data transmission between the two countries of up to 2,000 words per minute with alternative voice control and at virtually the same tariffs on telex.

#### The transmission of speech and signals

The services described above have indicated how wires and cables can be put to many uses other than that of a simple telephone conversation. With regard to speech communications, however, the only alternative to the telephone lines are electromagnetic waves. The Post Office control radio communications and are concerned with allowing the right frequency for the right job. They do not like to grant a licence if communications can be linked by

wires or cables.

There is an internationally agreed frequency band covering quite an extensive range of frequencies but some of them are already overloaded and others are reserved for special activities, which for security reasons cannot be revealed by the Post Office. The range of frequencies therefore that are allocated for business and industrial purposes does limit the kind of activities that can function by radio. Table 1 below gives some idea of the situation today in this country.

#### The transmission of still pictures

**Facsimile transmission:** Documents, drawings and photographs can be transmitted over telephone channels or private lines rented from the Post Office. The system consists of a transmitter or receiver. The document to be transmitted is wrapped around a drum and scanned by a light and a photo-multiplier cell. The operator dials the recipient's number and switches the transmission through on the same line and the document is reproduced at the receiver on electrosensitive paper in a matter of three minutes.

Facsimile transmission can operate over long distances and from country to country via transatlantic telephone cables or satellite communications. It has several uses and helps to eliminate the delays that often occur in sending documents through the post. Facsimile does not necessarily save time as far as the preparation of documents go since they have to be typed before they can be transmitted.

There are some firms, however, who have derived a method of transmitting words or drawings as they are being done. For instance Shipton Automation have manufactured what they call an 'Electrowriter.' By using such a machine a person at the receiving end can watch the message or drawing appear on his own machine as it is actually being done at the transmitting end. Likewise the recipient's signature or reply can be automatically received at the transmitting end.

The system operates over telephone lines and any number of stations can be linked. Contact is first of all made by telephone in the normal manner and then switched over to transmission. A conversation cannot take place during transmission. Shipton Automation have three types of machines:

1. A transceiver which sends and receives. It costs £700 or £40 a quarter to rent.
2. A transmitter—£410 or £21 10s. a quarter.
3. A receiver—£510 or £20 15s. a quarter.

**Slow scan television:** Another method of transmitting still pictures was recently demonstrated by ITT World Communications, an associate company of Standard Telephones and Cables Ltd. The demonstration took place in London and New York. The transmission path was a telephone channel over the Early Bird Satellite and photographs, documents and signatures were transmitted by a Videx Slow-scan television system from London to New York and vice versa. With this system a voice call is first made on the telephone requesting that a reproduction be sent. The document is placed in the Videx unit which contains a camera. The document is photographed in one-tenth of a second and may be

removed from the enclosure while the unit sends the picture to the monitor over the same telephone line being used for voice communication. The monitor screen is about 7 in. and the picture is retained for six minutes, during which time it may be recorded photographically if necessary.

#### The transmission of moving pictures

When closed circuit television is used within the confines of a building or a site the costs are realistic enough to make it a worth-while proposition for a good number of activities. Under these conditions there are no aerials or open circuits. The television camera, the camera control unit and the monitor are directly linked by cables. A number of cameras and monitors can be used and the cameras can be controlled from a remote point.

However when visual links cross a public highway a line has to be rented from the Post Office and the costs rise enormously as the distance increases. The main reason for this is the bandwidth of television requires. Unlike radio the techniques mentioned above which can operate over one telephone speech channel, television requires the equivalent of 900 telephone channels for 405 line and 1,800 for 625 line. The running costs alone therefore are likely to be in the region of £500 per mile per year. Even one-way link systems are very expensive. For example one between Newcastle upon Tyne and London would cost £70,000 per year.

These figures are rather frightening for a 'one-off' job, because the majority of firms do not have the volume of work that would justify spending this amount of money. This does not mean, however, that there is not the demand for closed circuit television, or that prices will not come down in the future, as new techniques (such as the laser beam) are developed to a practical level.

In the meantime the Post Office could do a lot to meet the growing demands of industry and business by setting aside special studios linked by closed circuit television for renting out to firms. This kind of service would enable firms to buy whatever television time they needed, and they would not be wasting money when the system was not in use. Another alternative would be to let private industries enter the market and permit them to build their own microwave links for private use and for renting out—as happens in America. Whatever is possible technically must also become possible economically if telecommunications are to be used successfully on the scale that I have suggested at the beginning of this article. There certainly seems to be no reason why closed circuit television services should not eventually be available to the individual at a price he can afford. This has often been the case in the past with other systems of telecommunications, such as the telephone service, and is becoming true (to some extent) of the computer industry today, as the demands for computer services increase.

Industrial, commercial and business organizations can of course help the Post Office to provide the right kind of services by giving some indication of what their future requirements will be. Architects and town planners can also do much to help, since

Table 1

Frequency Band MC/S	Some permissible uses	Remarks
Up to 150 KC/S	Induction loop systems for one way paging speech	Paging was first introduced in 1950 for locating doctors and personnel in large hospitals. Now used in many other types of jobs, e.g. locating stockbrokers in the Stock Exchange; locating personnel in large commercial stores. Consists of a receiver and transmitter. The receiver is pocket size. It emits a high pitched note when a signal is transmitted. Pocket paging can be integrated with an internal telephone exchange. Speech messages can be received on loop systems. Distance is limited. The range is about 1 mile in built-up areas. Licence costs £3.
27.12 31.75	(a) Paging (no speech) (b) Acknowledgement by tones	
VHF Low Band 71.5-72.8 76.95-78.0 85.0-86.3 86.9-86.7 86.95-88.0	Private mobile radio services	Selective calling permissible but experimentally on shared channels.  These frequency bands are overloaded.
156-165 approx.	Marine. Port operation. Public correspondence	156.0-160.6 assigned to lifeboat services. Overloaded.
159.15-159.950 163.675-164.450	Public correspondence	London radiophone service. Similar service operates in the SE. Lancs. area. Equipment installed in private or commercial vehicles (and caravans). Subscribers can have calls to or from any telephone subscriber in the British Isles. Licence is £7 10s. a quarter. Calls are 1s. 3d. for 3 minutes plus 5d. per minute thereafter.
159.95-160.125 164.45-164.625 160.975-161.125	Private radio answering (a) Acknowledgement by tones on any paging system. (b) Answer back. (c) One way paging with speech.	
VHF High band 165-173 approx.	Private mobile radio services	
174-175	Radio microphones	
VHF Band 475-488.5 480-481.5 482-484 487-488	Private point to point links. Private Telemetry.	Telemetry is a vast subject on its own. It is concerned with the measurement and transmission of things such as liquids and pressures, etc. which are in remote and often inaccessible places. The translation of the measurement and its transmission are the distinctive features of Telemetry, not the distance—which is irrelevant.
483-484 486-487 489.5-490.5 491.5-492.5	Paging. Private mobile radio services.	
488.5-488.8	Paging and Telemetry	
1,450-1,535	Point to point. Industrial mobile TV. Harbour radar broadcast. Private radio relay. Telemetry. Industrial TV.	
7,425-7,800	Private fixed microwave radio relay links. Wide band schemes. Point to point.	





Architects — E. R. Collister & Associates

## SILVER FOX STAINLESS STEEL GIVES CHARACTER TO WINDOW WALLING

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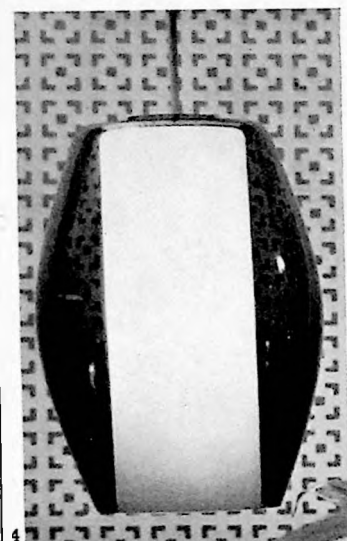
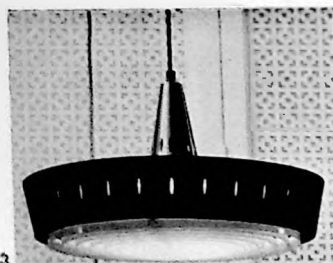
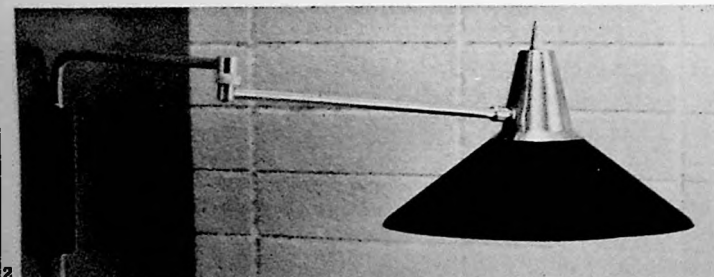
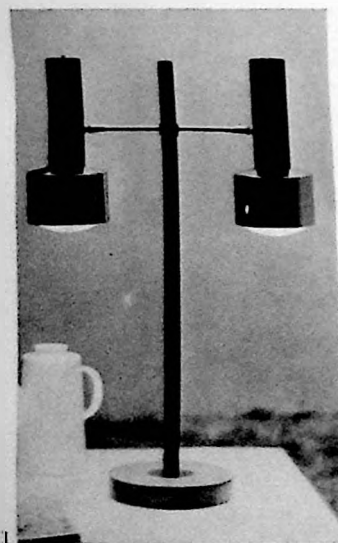
they are concerned with the functioning of activities at all levels, from simple activities inside buildings to an agglomeration of more complex ones outside—in streets, towns, cities and regions.

The architectural, town planning, and social implications of all this are important, as telecommunications could have as big an impact on our environment as the motor car has had, once we reach the stage of being able to do practically anything from the home.

## The Industry

### Low-cost light fittings

The range of fittings made from plastic cylinders and rectangular sections which Plus Lighting Ltd. introduced five years ago deserves to be better known. Although the standard fittings are commonplace, they provide a cheap and satisfactory alternative to glassware fittings in suspended, wall-mounted or base-mounted form. An additional advantage to cheapness and durability is flexibility in design. The standard cylindrical range is in diameters of 4 in., 5 in. and 6 in. with lengths from 6 in. to 36 in., but there is no restriction in size for contract work and the architect can design freely using



the basic elements of tube and holders. The retail price of the smallest standard pendant cylinder is 19s. 3d.

Plus Lighting are now producing an inexpensive mounted spot light fitting in metal, 1, for table or standard use. Vertical movement of the spots is impossible but they rotate through 360 deg. The retail price of the table model is £10 9s. 9d. Also available is a range of Dutch wall and pendant light fittings in glass and metal, 2-4. All of these are priced at less than £0 retail.

Plus Lighting Ltd., 2 Patshull Road, Kentish Town, NW5.

### Closet for women's public conveniences

Recent research into the requirements of women's public conveniences has exposed many fallacies in design and suggests new approaches in

planning and the design of fittings. A greater knowledge of the needs of the user should enable the designer to contribute to the improvement of the unsatisfactory conditions obtaining in most public conveniences.

In her research Mrs. Kathleen McBretney discovered that over 95 per cent of women do not use the closet seat in public conveniences; and that existing designs are ill-suited for use by children in the care of mothers. It is clear that ignorance of these factors in design



results in abuse and consequent soiling of conveniences. In conjunction with Adamsez, she has designed a closet for use in public conveniences which is low and narrow, with a clear opening dimensioned so that there is no contact with the closet in use. The bowl is long in shape to enable children to be held over it without overspill occurring. The advantages of the 'Lotus Bonne-Femme', 5, will be best realized if it is installed with foot pedal flush control in a cubicle which is of sufficient size to provide for the needs of mothers with children.

Adamsez Ltd., Fireclay Works, Scotswood, Newcastle upon Tyne 5.

## Contractors etc

**Residential Building, Peterhouse, Cambridge.** Architects: Sir Leslie Martin and Colin St. John Wilson. General contractor: Kerridge (Cambridge) Ltd. Sub-contractors: Cork tiling, maple strip flooring: Stevens & Adams Ltd. Hardwood windows: D. Burkle & Sons Ltd. Aluminium slider: Williams & Williams Ltd. Doors: John Sadd & Sons Ltd. Cupboards: Wreake Valley Craftsmen Ltd. Ironmongery: Neville Watts & Co. Passenger lift: Otis Elevator Co. Refuse disposal system: McLaren Johnston & Co. Trap door and collapsible ladder: Milles Ltd. Lightning conductor: W. J. Furze & Co. Window cleaning cradle: Palmers Travelling Cradle & Scaffold Co. Rainwater, soil, waste pipes, cold water services, sanitary fittings, etc.: Kershaw Heating Ltd. Electrical installation: Playford & Sons Ltd. Ceiling panel heating: ESWA Ltd. Special plaster and plastering generally: G. Cook & Sons Ltd. Greenhouse structure, etc.: W. Richardson & Co., Patent roof glazing: E. Parkinson (London) Ltd. Asphalt roofing and felt roofing: Cambridge Asphalt Co. Roof light: T. & W. Ide Ltd. Facing bricks: Pratts (Watford)

Ltd. Structural bricks: Sussex & Dorking Brick Co. Copper fascias: F. Braby. Main gables and special light fittings: D. Mackay. Bicycle holders: Le Bas Tube Co. Lightweight screed: Isocrete Ltd. Paint: Pinchin Johnson & Associates Ltd.

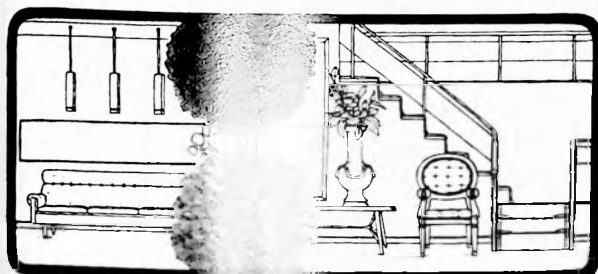
**Aviary, London Zoological Gardens.** Designers: Lord Snowdon, in association with Cedric Price and Frank Newby. General contractor: Leonard Fairelough (London) Ltd. Sub-contractors: Erection: Carter-Horsley (Engineers) Ltd. Assembly of aluminium structure: Norstel and Templewood Hawksley Ltd. Aluminium tubes: British Aluminium Co. Aluminium castings: Wm. Mills Ltd. Aluminium mesh: Westminster Engineering Co. Aluminium connectors: Erma Engineering Ltd. Cable manufacturers: British Ropes Ltd. Gables and hand-rail: J. Starkie Gardner Ltd. Trees: Landscape Trees Ltd.

**Cinema, Oxford Street, London.** Architects: David Dry, R. Hobb and Associates. General contractor: G. J. Syrrrett Ltd. Structural work: Redpath Brown & Co. Sprayed insulation: Chancery Ltd. Asbestos Ltd. Philips projectors: J. Blacklock Ltd. Cooling water system: J. Blacklock Ltd. R. A. Marshall Ltd. Sound equipment: Westrex Co. Cinema seating and wall coverings: Pathé Equipment Ltd. Ventilation and plumbing: Air Conditioning (London) Ltd. Carpet floor coverings: Hugh McKay. Rank Organisation. P.A.C. and rubber flooring: The Lino Tile Co. Fibrous plaster and auditorium ceiling: Plaster Decoration Co. Sanitary fittings: Morgan and Son Ltd. Category boards, signs, etc.: Marcus Sewell. Metawork: Meta Phronts Co. Electric hand dryers: Warner Howard Ltd. Main screen curtains: Tibor Ltd. Drainage: P. E. Pettifor Ltd. Terrazzo: Marriott & Price Ltd. Electrical work: G. K. Rhodes & Co. Wall tiling: Wiggins Sankey Ltd.

**Hospital Board Office, Chesterton, Cambs.** Architects: Johns Slater & Howard. General contractor: Johnson & Bailey Ltd. Sub-contractors: Electrical services: Eastern Electrical Co. Mechanical services: J. Wontner Smith Grey & Co. Lift: Pickering's Ltd. Telephone: Communication Systems Ltd. Kitchen equipment: James Stott & Co. Site seeding and planting: J. Yeoman Webb. Aluminium sash windows: Alumin Building Components Ltd. Lightweight screed: Celeon Ltd. Curtain walling (to main staircase): Williams & Williams Ltd. Precast concrete edge beams: Atlas Stone Co. Facing bricks: G. Tucker & Son. Steel roof trusses (Hollerith block): Dawneys Ltd. Ironmongery: Parker Winder & Achurch Ltd. Strongroom door: Chatwood Milner Ltd. Felt roofing and asphalt work: Cambridge Asphalt Co. Glazing: Grent Yarmouth Glass Co. Plumbing and c.i. drainage: T. R. Freeman & Son. Plastering and floor screeds: A. E. Rose & Sons. Floor finishes (Bulgomme rubber wood block): Acme Flooring Ltd. Floor and wall tiling and linoleum: J. E. James. Road surfacing: Constable Hart & Co. Polisher: G. R. Turner.

Building techniques, materials and equipment, furnishings and fabrics are the tools that architects must use. Many British and foreign products introduce themselves by way of the REVIEW's advertisement pages—and the AR Reader's Enquiry Service, contacted by using the reply-paid form at the back of the magazine, will produce more detailed information without waste of time.





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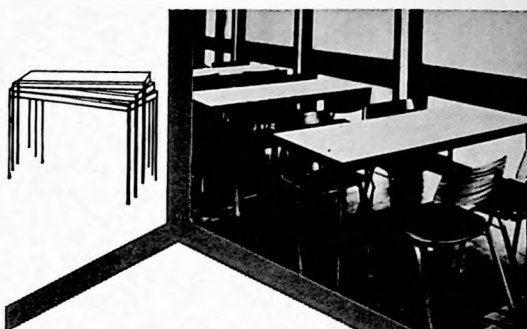
The introduction of the Peerage range of fine Wiltons increases the already famous Golden Shield Contract Service. Enquiries should be directed to Kidderminster or branch showrooms in London, Bristol, Manchester, Liverpool, Leeds, Newcastle, Glasgow and Belfast. Underfelt can be supplied at the same time if required. The advice of the company's experts is freely available at all times.

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Jack Stafford matches his famous Walton range of chairs with this clever spiral stacking table using sturdy square tube for the legs and rectangular tube for the underframe.

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The photograph of 250 tables with Walton chairs is by courtesy of Henley College of Further Education, Coventry.

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Ian Nairn

# STOP PRESS

A monthly anthology from all over Britain of townscape problems, outrages and opportunities, compiled by Ian Nairn with drawings by G.J.Nason.

## SOS

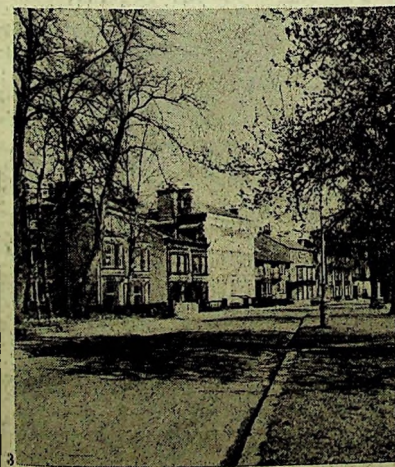
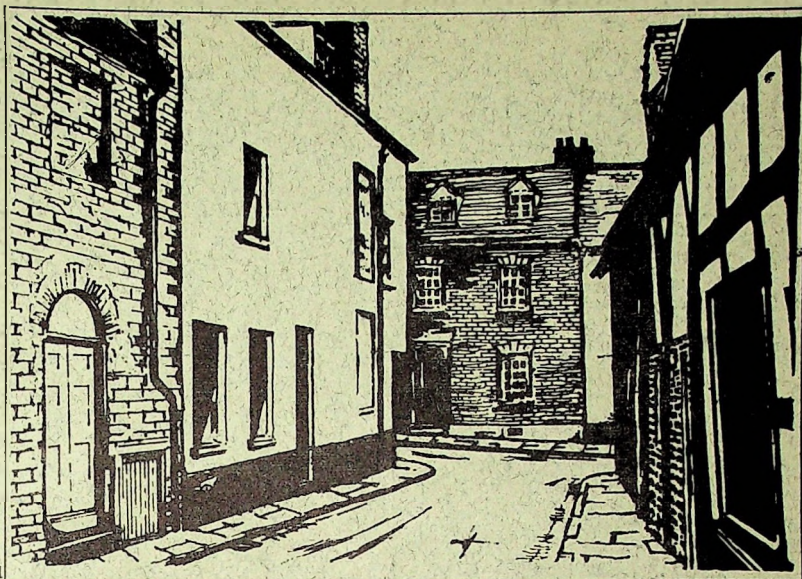
### WARWICK

A perfect piece of English townscape, 1, with the Leicester hospital on the right and the 'Bear and Baculus' on the left. But the latter is to come down for street widening, apparently to give a better entry to a bus station. There must be some other possible solution, for one of the best towns in the Midlands.

## OUTRAGE

### HARROGATE

Modern architecture at its worst, 2, bursting into the leafy delicacy and variety of Harrogate. The advertisement



says 'Classic flats of dignity and privacy.' The near surroundings are shown in 3.

### HARTFORD, NEAR HUNTINGDON

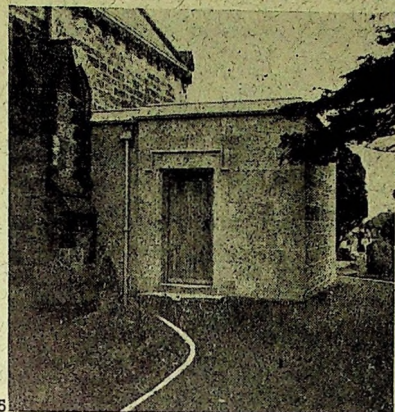
Straight-through road widening in the worst pre-war style, 4, slicing off a bend in an attractive village for a minimal gain in road improvement yet breaking open the old shape once and for all. The present increase in traffic will probably mean a complete by-pass will be needed in a few years. Alas, it will come too late for Hartford.





## DERBY

Architecture as she is spoke; church extension near Derby, 5.



## CREDIT

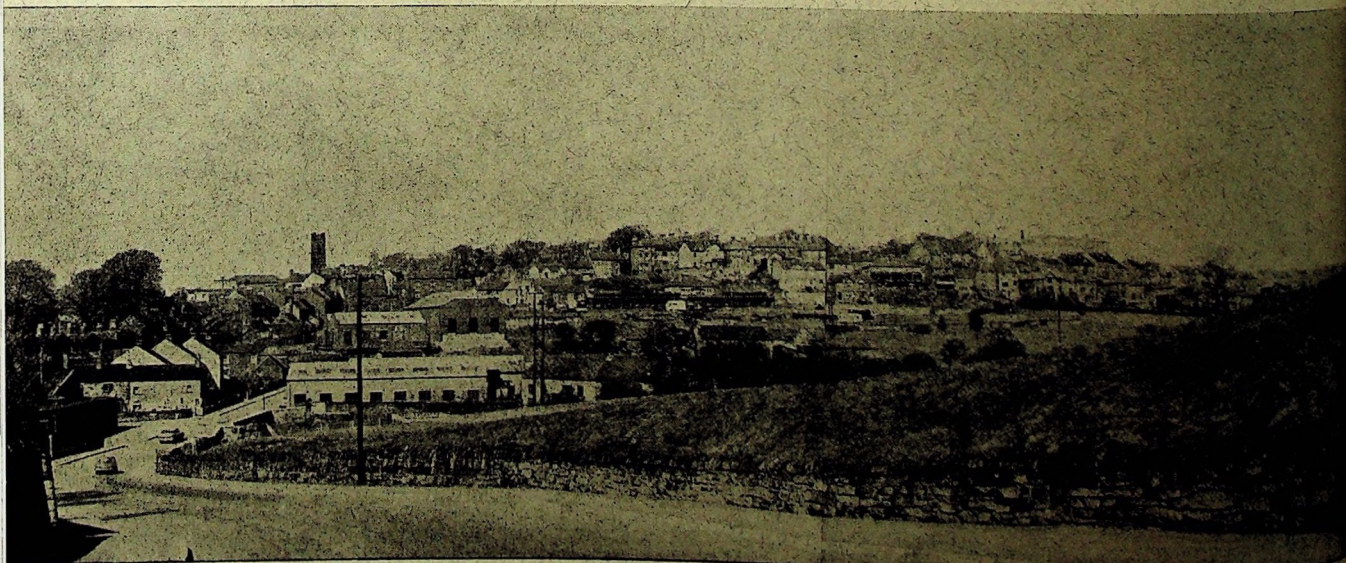
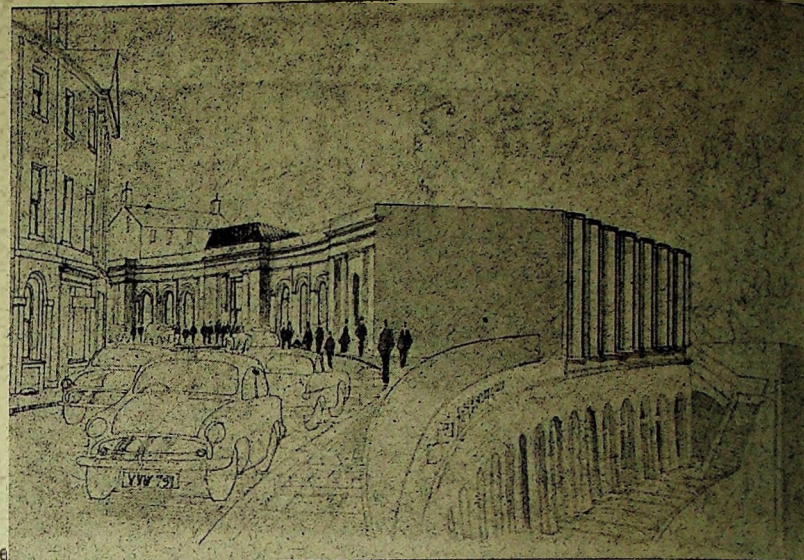
### MONMOUTH

A reconstruction by Donald Insall of the former Monmouth market, damaged by fire a few years ago (see AR, December 1963). It takes advantage, 6, 7, of the dramatic riverside view and uses the space admirably as library, post office, coffee bar and Nelson museum. This still leaves a blank end wall as the entry to the town centre: a good place for sculpture—or a figurehead.

## OPPORTUNITY

### BELPER, DERBYSHIRE

A fine site—immediately south of the town centre—being dribbled away instead of having a pattern, 8. When will the local planners realize that there are far more good places north of the Trent than south of it?





# A layman's guide to the History of DOORS

**Cave man style** Locking up for the night must have been quite a performance in Stone Age days. And just think of the finger-trapping opportunities in trying to get a windproof seal with a sharp edged rock.

**Norman style** The Normans, being such frightfully efficient chaps, had things much better organised and invented the drawbridge, which is said to have given rise to the Old English saying: "Pull up the drawbridge, Jacques, je suis sur board."

**Gothic style** The reason for the Gothic arch is simple:

'Tis merely to accommodate the whimper.

**Baroque style** The Baroque style of ornamentation was, of course, nothing but a carefully calculated disguise, so that

afterwards you could never remember which door you had been smuggled through — or indeed whether it was not a door at all but a secret bookcase fronting directly on to the lower reaches of the Grand Canal.

**Scottish croft style** A dour door, but foursquare as its owner and his wee foursquare doggie.

**Leaderflush 1965 style** Much has been written about the unquestionable merits of the Leaderflush door of 1965 but modesty (to say nothing of lack of space) forbids us to reveal the full inside story here. But a letter or 'phone call will bring you a copy of our booklet. Tells you everything.

"Frank... outspoken. Reveals the most intimate details where others fear to speak." *The Doorknockers Journal*.

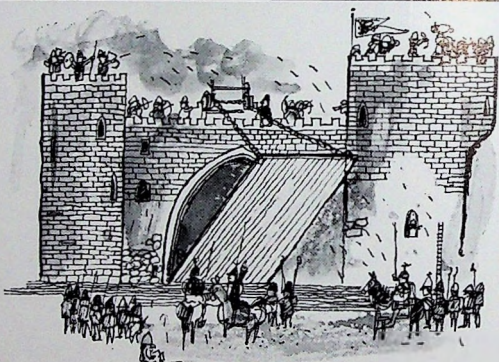
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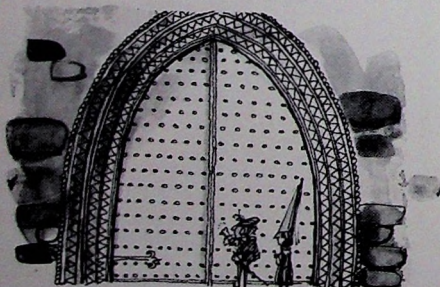
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*Cave man style*



*Norman style*



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*Scottish Croft style*



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